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JOURNAL

of the

AMERICAN

VETERINARY MEDICAL

ASSOCIATION

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VOLUME XCVII, NUMBER 760

JULY 1940

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"CORN STATES"

and

THE DEMESNE OF ITS ACTIVITY



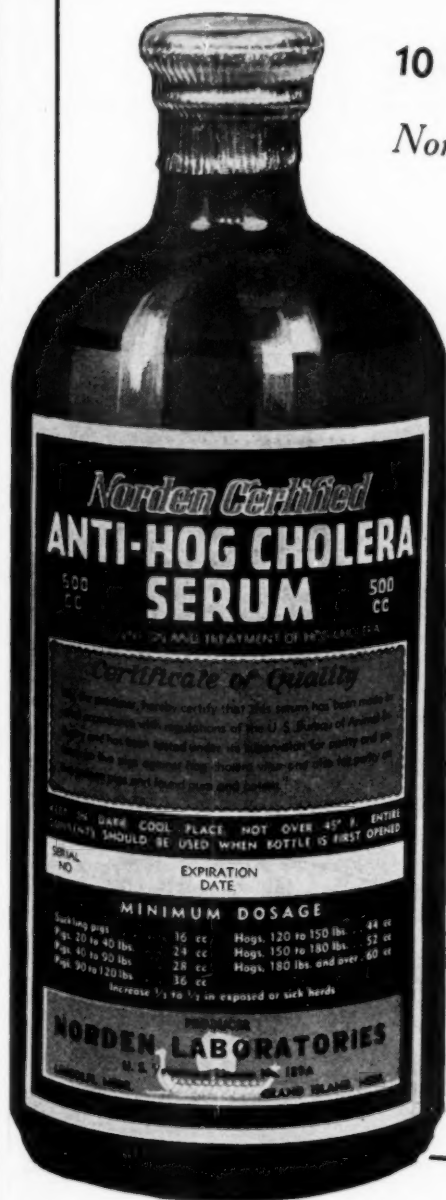
Group of Buildings Housing the United States Department of Agriculture, Emblematic of the Evolution of American Farming and the Midwestern Empire to Which "Corn States" Owes Its Allegiance.

This symbol of achievement represents the advancement of veterinary science and practice under the stewardship of the American Veterinary Medical Association which, by meeting in Washington in August, provides the occasion to marvel at the magnitude of the "house" the veterinary profession helped to erect.

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Journal of the American Veterinary Medical Association

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\$5.00 per annum.

Foreign \$6.00; Canada \$5.50

Single Copies 75 cts. prepaid in U. S.

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Biography
Journal

of the

American Veterinary Medical Association

600 S. Michigan Ave., Chicago, Ill.

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VOL. XCVII

JULY 1940

NO. 760

Eighteen Ninety-One

WHEN THIS SOCIETY met in Washington in 1891, it was 28 years old. The academic pioneer of our field—the Ontario Veterinary College—was 29. Iowa State College, first of the state colleges to establish a complete course in veterinary medicine, had been honoring our profession for twelve years, money poor but proud of its rank and importance to the Midwest. The American, first of the private schools to flourish in the United States, was 16, and the Chicago 8. The Bureau of Animal Industry, U. S. Department of Agriculture, was a few months over 7. State associations, few but ambitious, were bombarding legislatures for licensure laws and looking askance at the college curricula and entrance requirements. The large cities counted their qualified veterinarians on the fingers of one hand, and many of the smaller ones knew nothing of them. The cohort of self-made hippiaters was beginning for the first time to feel the coming of a new army of animal doctors when the United States Veterinary Medical Association con-

vened at the national capital for its 28th annual session on September 15 of that year.

To declare that the veterinary service of 1891 in this embryonic state actually made the United States the wealthiest nation of

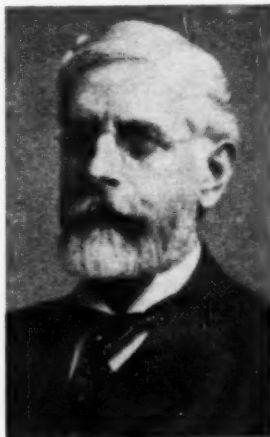
known history is pragmatic, fantastic as it may seem. The declaration will bear analysis and comparison with the mechanical inventions and scientific discoveries which have been much better dramatized.

The year we shall commemorate at the Mayflower Hotel in August will live through the ages in our circle as the historic date when:

a) The research laboratories of the federal veterinary service incriminated insects as the carriers (and vectors) of microbic infections and thereby laid bare the broad field of investigation that has revolu-

tionized etiology and preventive medicine, and specifically, in animal production, opened the way for the development of large-scale cattle breeding in the southern states.

b) Bovine contagious pleuropneumonia, which had spread as far west as Missouri, threatening to root itself beyond human control into the vast cattle-breeding industry, was exterminated. The battle against that plague, under the command of Chief



D. E. Salmon,* Cornell '76
(1850-1914)

*First chief and organizer of the Bureau of Animal Industry, U. S. Department of Agriculture; president of the Association, 1897-1898. Though the meeting of 1891 was held in Washington, Chief Salmon did not attend. At the time of the meeting he was representing Secretary of Agriculture Rusk at the International Congress of Agriculture and Demography at London.

Salmon, ended victoriously with the coming of 1892. Oppressed by this disease, the United States could not have become a great agricultural nation.

c) Eighteen ninety-one marks the beginning of federal meat inspection by veterinarians. Instituted to protect domestic consumers and to retrieve lost foreign trade, this service has developed to gargantuan proportions *sans reproche* to the advantage of better health for men and animals. In terms of public health and national wealth the value of "U. S. Inspected and Passed" is incomputable.

But, besides these facts of record it was in 1891 that the word "eradication" was coined, thereafter to signify a national principle in the operations of the country's veterinary service. Following the conquest of bovine contagious pleuropneumonia the principle led to such unprecedented undertakings as exterminating Texas fever, animal tuberculosis, dourine, fowl pest, foot-and-mouth disease, and keeping out other impoverishing plagues. The extent to which the United States and the Dominion of Canada are indebted to their veterinary-medical projects is the outgrowth, to a remarkable degree, of work carried to a successful end in the year we are about to celebrate in Washington, the shrine of these labors.

Forty-nine years ago public veterinary education was an undernourished child struggling for sufficient appropriations to maintain a respectable front. Its two units—Iowa and Ohio—lacked buildings, equipment, teachers. Private schools were the main source of the graduates needed to supply the demand of the government and states. Large cities and vast rural areas were yet to understand that animal medi-

cine is an important science. Confusing plagues of horses, cattle, sheep and swine raged unchecked. The federal government and some of the states were laying the foundation of our erstwhile neglected profession. Meat inspection was being founded along with research in animal diseases. The paid-up membership of the national association was less than 200, and as the

secretary wrote (*Am. Vet. Rev.*, Dept. 1891, page 305), the meeting of 1891 was really the second since the Association really became national in character through having met in Chicago, the year before. The attendance of the 1891 meeting is recorded as "about 75." The banquet (at \$5.00 per cover) drew 60.

The year was the starting point of the campaign to increase college courses from two to three years. C. C. Lyford of Minneapolis sponsored the

movement, which rapidly won support.

The results of the 1940 activities are a membership of over 6,000; a prospective attendance of 2,000 at the Washington session; a *JOURNAL* circulation of 7,000; and a program covering education, research, practice, and professional questions. Moreover, all major animal plagues are under control. These facts indicate by comparison that there is much for which to be thankful.

Know Your Opportunity

THE ELECTION of members of the Executive Board by mail ballot began in 1916, immediately after the adoption of the present constitution at the Detroit meeting that year. The country was then divided into but five districts. The first board thus elected was composed of F. Torrance, W. Horace Hoskins, John R. Mohler, C. H. Stange, and R. A. Archibald. In effect, the divisions were: Canada, the East, the



The Mayflower Hotel, Washington, D. C.—headquarters of the 77th annual meeting, August 26-30, 1940.

South, the Midwest and the West. The election was conducted by the present executive secretary, who was voted to the office of secretary at the Detroit meeting (1916).

As the first election showed that the number of members in the Midwest was preponderant, the country was soon reapportioned into ten districts, as nearly as practical, according to the number of members each one contained. A member-at-large, to be elected at the annual meeting, was added. Later, the president and the president-elect were included as *ex-officio* members with the same franchise as the other members. Thus, the present make-up of the Executive Board is explained. Equitable representation was the object.

The members were slow in taking an interest in these elections. Although the changes were published in the JOURNAL, lack of editorial comment on the purpose of the changes kept the membership uninformed and, therefore, in a state of indifference to the privilege extended. The member isolated at a distant locale was slow to realize that he had as much power in the management of the Association as the regular speakers of the annual conventions. All of this is now better understood, though there is still room for improvement.

Practitioners, particularly, remain unaware of the opportunity extended to them, and nothing more clearly proves the lack of understanding than the movement to establish a national association of their own, with the obvious intention of putting their shoulder to the AVMA—a powerful going concern which, in years past, did not always shape its administrative and legislative branches to the practitioners' advantage.

The Executive Board districts and the method of electing the members of the

Board give each member of the Association an opportunity to participate in the smallest detail of organized veterinary medicine in this country and in Canada.

But, the House of Representatives, created to function for the first time at the meeting of 1935 at Columbus, still further purifies the democracy of the Association. All any practitioner needs to do to see that he is properly represented is to belong to his state association and aid in selecting the proper delegate to the annual convention. This body is more powerful than the Executive Board. It is the court of last resort.

World's Fair Tour

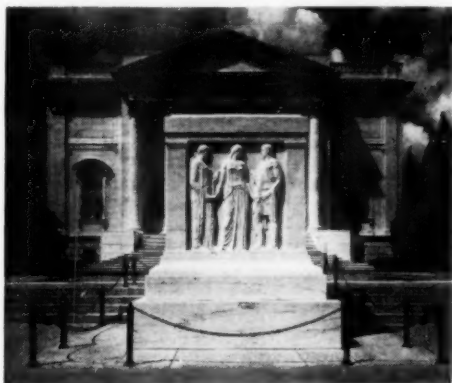
ARRANGEMENTS have been made with the American Personal Guidance Travel Service, 7 St. Paul Street, Baltimore, Md., for a three-day all-expense tour. This tour will cost \$14.25 and includes all expenses except

transportation from Washington to New York. Transportation has been purposely omitted on account of the fact that most members will either use their automobiles or have purchased round-trip railroad tickets which provide for stopovers in New York.

Briefly the tour includes the following features: room accommodations with choice of the city's most modern and best-located

hotels; a stipulated number of meals; a thrilling sightseeing bus trip with guide-lecturer to show Up- and Downtown New York; choice of the following: 1) N.B.C. studios, 2) N.B.C. television, 3) Rockefeller Center observation roof, or three-hour yacht cruise.

Many World's Fair paid features also are included. For information write to American Personal Guidance Travel Service.



—Photo by Harris & Ewing.

Tomb of the Unknown Soldier in
Washington, D. C.

WASHINGTON

Pre-Convention Meeting—Monday, August 26

Morning Session

10:00—Meetings of the Executive Board and committees. Hours and rooms to be announced on the printed program which will be mailed about August 1.

Evening Session

7:00—AVMA film on veterinary science

exhibit at the New York World's Fair.

7:15—"Know Your Money," sound motion picture shown by M. R. Allen, Agent in Charge, United States Secret Service, Washington, D. C.

7:45—House of Representatives.

» » » » » »

Opening Ceremony—Tuesday Morning, August 27 (Grand Ballroom)

10:00—Call to order.

Music.

Invocation—Hubert Bunyea, B.A., D.V.M., Former Pastor, Fountain Memorial Baptist Church, Washington, D. C.

Address of Welcome—John Russell Young, President, Board of Commissioners, Washington, D. C.

Response—George W. Gillie, D.V.M., Member of Congress, Washington, D. C.

Greetings from the Women's Auxiliary—Mrs. C. H. Case, President, Akron, Ohio.

Presentation of certificate to President Cassius Way by H. W. Jakeman, Chairman, Executive Board.

Presentation of gold key and scroll to President-Elect A. E. Wight by H. W. Jakeman.

Presentation of Twelfth International Veterinary Congress prize by H. W. Jakeman.

President's Address.

Announcements by H. M. O'Rear, Chairman, Subcommittee on Entertainment.

» » » » » »

First General Session—Tuesday Afternoon, August 27 (Grand Ballroom)

1:15—Film: "The Life Cycle of the Rocky Mountain Spotted Fever Tick," Rocky Mountain Laboratory, U. S. Public Health Service, Hamilton, Mont.

1:30—Laboratory Tests of the Potency of Rabies Vaccines—Ralph W. G. Wyc-koff, Ph.D., Associate Director in Charge of Research on Virus Diseases, Lederle Laboratories, Inc., Pearl River, N. Y.

Canine Rabies Vaccination. An Experimental Study of the Efficacy of the Single Intraperitoneal Injection Method with Phenol-Treated Vaccine—Chas. N. Leach, M.D., A.B., C.P.H., Staff Member, International Health Division of the Rockefeller Foundation, Montgomery, Ala.

Discussions

Col. R. A. Kelser, D.V.M., A.M., Ph.D.,

CONVENTION

Colonel, V.C., U. S. Army, Chief, Veterinary Division, Surgeon General's Office, War Department, Washington, D. C.

H. W. Schoening, V.M.D., Chief, Pathological Division, Bureau of Animal Industry, Washington, D. C.

A. Eichhorn, D.V.M., Director, Animal Disease Station, Beltsville, Md.

Chemical, Physical and Biological Characteristics of Viruses, Especially of Equine Encephalomyelitis—Joseph W. Beard, M.D., B.S., Assistant Professor of Surgery, Duke University School of

Medicine, Duke Hospital, Durham, N. Car.

Twenty-Five Years' Progress in the Study of Brucellosis—I. Forest Huddleson, D.V.M., Ph.D., Research Professor, Michigan State College, East Lansing, Mich.

Vaccine to Control Brucellosis in Cattle—C. M. Haring, D.V.M., Professor of Veterinary Science, University of California, Berkeley, Calif., and Jacob Traum, D.V.M., Professor of Veterinary Science, University of California, Berkeley, Calif.

» » » » » »

Second General Session—Thursday Morning, August 29 (Grand Ballroom)

9:00—Film: "The Formation of the Hen's Egg"—D. C. Warren, A.B., A.M., Ph.D., Professor of Poultry Husbandry, Kansas State College, Manhattan, Kan., and H. M. Scott, B.S., M.S., Ph.D., Associate Professor of Poultry Husbandry, Kansas State College, Manhattan, Kan.

9:15—The Poultry Industry Needs the Veterinarian—James E. Rice, Mexico, N. Y.

But What About Poultry?—Cliff D. Carpenter, D.V.M., M.S., Pathologist, Allied Mills, Inc., Fort Wayne, Ind.

The Veterinary Service of a State—W. J. Butler, D.V.M., State Veterinary Surgeon and Executive Officer, Montana Livestock Sanitary Board, Helena, Mont.

Discussions

Ward Giltner, D.V.M., Dean, Division of Veterinary Science, Michigan State College, East Lansing, Mich., and D. M.

Campbell, D.V.S., Editor, *Veterinary Medicine*, Chicago, Ill.

The Need and Significance of Veterinary Preventive Medicine in Present-Day Veterinary Education—A. F. Schalk, D.V.M., Professor of Veterinary Medicine, The Ohio State University, Columbus, Ohio.

The Rôle of the Veterinarian in Effective Immunization Against Hog Cholera with Tissue Vaccine—Wm. H. Boynton, D.V.M., Professor of Veterinary Science, University of California, Berkeley, Calif.

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. . . The Esso Touring Service, 261 Constitution Ave., N. W., Washington, D. C., and the Conoco Travel Bureau, Denver, Colo., will furnish you maps with routes laid out thereon, free of charge. Just address a letter to either of these bureaus, requesting the information desired.

*Section on Research—Wednesday, August 28
(East Room)*



Left, H. L. Gilman, Ithaca, N. Y., chairman of the Section; right, Frank Thorp, Jr., Fort Collins, Colo., secretary.



Morning Session

9:00—Studies on Bovine Mastitis—Mastitis in Heifers—C. C. Palmer, D.V.M., M.S., Director, Haskell Animal Disease Research, Professor of Bacteriology and Hygiene, University of Delaware, Newark, Del., James C. Kakavas, B.S., M.S., Ph.D., Assistant Professor of Bacteriology and Hygiene, University of Delaware, Newark, Del., and James R. Hay, D.V.M., B.A., Assistant Bacteriologist and Veterinarian, Haskell Animal Disease Research, Instructor in Bacteriology and Hygiene, University of Delaware, Newark, Del.

The Comparative Accuracy of the Electrometric Method in the Diagnosis of Mastitis—Ernest C. McCulloch, D.V.M., M.A., Ph.D., Associate Professor of Bacteriology and Parasitology, College of Veterinary Medicine, State College of Washington, Pullman, Wash.

Efficiency of the Microscopic Examination of Incubated Milk Samples for the Detection of Mastitis Streptococci—Albert L. Kleckner, Ph.D., Research Associate in Milk Hygiene, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa.

Bang's Disease. 1. Variations in Blood

Reactions. 2. The Incidence of Abortion and Sterility in Infected and Non-infected Groups. 3. The Significance of Alterations of the Fetal Membranes—C. F. Clark, D.V.M., Assistant Professor and Research Assistant in Animal Pathology, Michigan State College, East Lansing, Mich., and E. T. Hallman, D.V.M., Professor of Animal Pathology, Michigan State College, East Lansing, Mich.

Brucellosis of Horses and Cattle—W. S. Stone, D.V.M., M. S., Instructor, Cornell University, Ithaca, N. Y.

Results Obtained by Long-Continued Cultivation of *Brucella Abortus* in Chick Embryos—H. J. Metzger, D.V.M., Assistant Professor, Agricultural Experiment Station, New Brunswick, N. J., and Freida R. Stokes, M.S., Assistant, Agricultural Experiment Station, New Brunswick, N. J.

Studies on Genetic Resistance in Swine to *Brucella* Infection—H. S. Cameron, D.V.M., M.S., Ph.D., Assistant Professor of Veterinary Science, University of California, Davis, Calif., E. H. Hughes, B.S.A., M.A., Ph.D., Professor of Animal Husbandry and Animal Hus-

bandman in the Experiment Station, University of California, Davis, Calif., and P. W. Gregory, B.S., M.S., Sc.D., Associate Professor of Animal Husbandry, University of California, Davis, Calif.

Afternoon Session

1:30—Nonspecific Hemoglobinemia and Acute Pulmonary Emphysema of Cattle as Essential Enterotoxemias—Frank W. Schofield, V.S., D.V.Sc., Head, Department of Bacteriology and Pathology, Ontario Veterinary College, Guelph, Ont.

Studies of Chick-Embryo-Propagated Equine Encephalomyelitis Virus and Vaccine: Antigenicity and Preservation—M. S. Shahan, D.V.M., Pathological Division, Bureau of Animal Industry, Washington, D. C., and Ervin A. Eichhorn, V.M.D., Pathological Division, Bureau of Animal Industry, Washington, D. C.

The Pathology of the Bovine Kidney in Vitamin A Deficiency—Robert F. Langham, B.A., M.S., Research Assistant in Animal Pathology, Michigan Agricul-

tural Experiment Station, East Lansing, Mich., L. B. Sholl, D.V.M., B.S., M.S., Research Assistant in Animal Pathology, Michigan Agricultural Experiment Station, East Lansing, Mich., and E. T. Hallman, D.V.M., Professor of Animal Pathology, Michigan Agricultural Experiment Station, East Lansing, Mich.

Studies on *Thysanosoma Actinioides*—F. X. Gassner, D.V.M., Assistant Pathologist, Colorado Experiment Station, Fort Collins, Colo., and Frank Thorp, Jr., D.V.M., M.S., Ph.D., Associate Pathologist, Colorado Experiment Station, Fort Collins, Colo.

Determination of Parentage in Cattle by Means of Cellular Antigens in the Blood—Lloyd C. Ferguson, D.V.M., M.S., Ph.D., Instructor in Veterinary Science, University of Wisconsin, Madison, Wis.

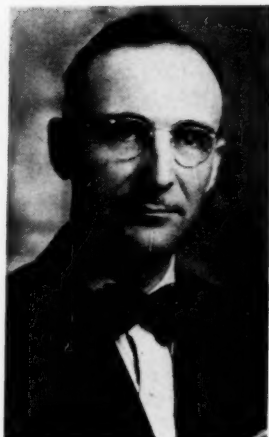
Sulfapyridine in Cattle: a Contribution to Its Pharmacology—Louis A. Klein, V.M.D., Sc.D., Professor of Veterinary Hygiene and Pharmacology, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., Albert



SUBCOMMITTEE ON LADIES' ENTERTAINMENT, 77TH ANNUAL MEETING

Seated (left to right): Mrs. Adolph Eichhorn, Mrs. Irving M. Cashell, Mrs. C. D. Lowe (chairman), Mrs. W. Taylor Miller, and Mrs. H. W. Schoening. Standing (left to right): Mrs. Willard H. Wright, Mrs. H. M. O'Rear, Mrs. Walter J. Hall, Mrs. Mark Welsh, Mrs. R. A. Kelsner, and Mrs. D. I. Skidmore. (Absent on account of "flu" when this photograph was taken were Mrs. George W. Gillie, Mrs. Wm. A. Hooker, Mrs. John R. Mohler and Mrs. Mason Weadon.)

Section on General Practice—Wednesday, August 28
(Grand Ballroom)



Left, W. A. Aitken,
Merrill, Iowa, chair-
man of the Section;
right, W. R. Krill,
Columbus, Ohio,
secretary.



Morning Session

9:00—Films: "The Action of the Ruminant Stomach" and "Mechanism of the Heart Beat"—A. F. Schalk, The College of Veterinary Medicine, The Ohio State University, Columbus, Ohio.

9:15—Diseases of Swine Due to Nutritive Deficiencies — H. C. H. Kernkamp, D.V.M., M.Sc., Associate Professor of Veterinary Medicine, Division of Veterinary Medicine, Minnesota Agricultural Experiment Station, University Farm, St. Paul, Minn.

Further Investigations of Rumen Gases and Bloat in Ruminants—R. W. Dougherty, D.V.M., B.S., Assistant Professor of Veterinary Medicine, Department of Veterinary Medicine, Oregon State College, Corvallis, Ore.

(Continued from preceding page)

L. Kleckner, Ph.D., Research Associate in Milk Hygiene, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., and Robert O. Blitz, V.M.D., Research Associate in Milk Hygiene, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa.

Digestive Diseases of Ruminants Resulting from Abnormal Conditions Affecting the Fore Stomachs—R. A. McIntosh, M.D.V., B.V.Sc., Professor of Cattle Diseases, Obstetrics, Materia Medica, Ontario Veterinary College, Guelph, Ont.

The Physiology of Ketone-Body Formation—C. E. Hayden, D.V.M., A.B., Professor of Veterinary Physiology, Cornell University, Ithaca, N. Y.

Acetonemia in Dairy Cattle—W. A. Barnette, D.V.M., B.S., Practitioner, Greenwood, S. Car.

Gastrointestinal Parasites of Sheep and Their Control—R. E. Rebrassier, D.V.M., M.Sc., Professor of Veterinary Parasitology, The Ohio State University, Columbus, Ohio.

Afternoon Session

Abdominal Surgery in Equidae—James Farquharson, D.V.M., Professor of Surgery and Clinics, Colorado State College, Fort Collins, Colo.

Some Present-Day Problems in Clinical Diagnosis—C. H. Covault, D.V.M., Head, Department of Veterinary Medicine, Division of Veterinary Medicine, Iowa State College, Ames, Iowa.

Ophthalmology in Equidae—B. J. Errington, D.V.M., Ph.D., Clinical Pathologist, Department of Animal Pathology, Kentucky Agricultural Experiment Station, Lexington, Ky.

Problems Encountered in Feeder Cattle—A. H. Schmidt, Practitioner, Triumph, Minn.

Practical Cattle Surgery—J. C. Carey, D.V.M., Practitioner, West Liberty, Iowa.

The Effects of Disease on the Calcium, Inorganic Phosphorus, and Serum Proteins of Horse Blood—A. Henry Craige,

Jr., V.M.D., Instructor in Veterinary Physiology, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., and John D. Gadd, V.M.D., Practitioner, Towson Veterinary Hospital, Towson, Md.

Studies on the Relationship of Brucellosis to Periodic Ophthalmia—E. L. Stubbs, V.M.D., Professor of Veterinary Pathology, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., and W. Graham Love, V.M.D., Research Associate in Animal Pathology, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa.

» » » » » »

***Section on Small Animals—Wednesday, August 28
(Terrace Garden)***



Left, John R. Wells, West Palm Beach, Fla., chairman of the Section; right, Roy E. Nichols, Columbus, Ohio, secretary.



Morning Session

9:00—Roentgen Diagnosis in Small Animal Diseases (illustrated with slides)—Gerry B. Schnelle, V.M.D., Staff, Angell Memorial Hospital, Boston, Mass.

Economics and Its Application to Hospital Therapy and Hygiene—Charles C. Rife, D.V.M., Practitioner, 420 Edgewood Ave., S. E., Atlanta, Ga.

The Value of Well-Planned Surgery—D. A. Eastman, D.V.M., Practitioner, 700 N.E. 75th St., Miami, Fla.

Some Points in Feline Medicine—Glenn L. Ebright, M.D.C., Practitioner, Hammond, Ind.

Afternoon Session

1:30—A Small Animal Practitioner's Relations with His Clients—C. N. Bramer, D.V.M., Practitioner, 1021 Davis St., Evanston, Ill.

Some Diseases of the Ear of Dogs—H. C. Stephenson, D.V.M., B.S., Professor of Materia Medica and Small Ani-

Section on Sanitary Science and Food Hygiene
Wednesday, August 28 (Mezzanine Assembly)



Left, M. B. Starnes,
Dallas, Texas, chair-
man of the Section;
right, Murrell O.
Robinson, Auburn,
Ala., secretary.



Morning Session

9:00—Swine-Erysipelas Symposium

The Occurrence of Swine Erysipelas in the Human Family—Glenn S. Everts, A.B., M.D., Plant Physician, F. G. Vogt & Sons, Philadelphia, Pa.

The Sectional Incidence of Swine Erysipelas in the United States—W. T. Spencer, D.V.S., Regional Manager, National Live Stock Loss Prevention Board, Omaha, Neb.

Swine Erysipelas: Embracing the Agglutination Test and Report on a Study of Arthritis in Swine—H. W. Schoening, V.M.D., Chief, Pathological Division, Bureau of Animal Industry, Washington, D. C., O. L. Osteen, D.V.M., Bureau of Animal Industry, Washington,

(Continued from preceding page)

mal Diseases, Cornell University, Ithaca, N. Y.

Small Animal Dentistry—Alan C. Seccord, V.S., B.V.Sc., M.Sc., Practitioner, 1105 Yonge St., Toronto, Ont.

Vitamin Deficiencies and Their Relation to the Testing of Commercial Dog Foods (illustrated with motion pictures in color)—M. L. Morris, D.V.M., B.S., Director, Raritan Hospital for Animals, New Brunswick, N. J.

D. C., and C. G. Grey, D.V.M., Bureau of Animal Industry, Washington, D. C.

Bacterial Dissociation in Brucella Abortus—Carroll K. Mingle, D.V.M., M.Sc., Assistant Veterinarian, Animal Disease Station, Beltsville, Md., and Chester A. Manthei, D.V.M., Assistant Veterinarian, Animal Disease Station, Beltsville, Md.

Field Experiments in Bang's Vaccination—Melvin Rabstein, V.M.D., Federal Coöperative Agent, Live Stock Sanitary Service Laboratory, College Park, Md., and Mark Welsh, D.V.M., B.S., State Veterinarian, Live Stock Sanitary Service Laboratory, College Park, Md.

The Bacterial Content of Goat Milk (illustrated with lantern slides)—C. S. Bryan, B.S., M.S., Ph.D., Research Assistant in Bacteriology, Michigan State College, East Lansing, Mich.

Afternoon Session

1:30—Requisites for a Practical Intracutaneous Test for the Detection of Trichina Infection in Swine—Benjamin Schwartz, Ph.D., Chief, Zoölogical Division, Bureau of Animal Industry, Washington, D. C.

Studies on the Control of Liver Flukes

of Cattle in the Hawaiian Islands—J. E. Alicata, B.A., M.A., Ph.D., Parasitologist, Hawaii Agricultural Experiment Station, University of Hawaii, Honolulu, T. H.

Discussion to be opened by G. Dikmans, B.S.A., D.V.M., Bureau of Animal Industry, Washington, D. C.

Epidemiology and Veterinary Aid in

Epidemics—Fred W. Graves, D.V.M., Senior Milk Sanitarian, New York State Department of Health, Albany, N. Y.

Outbreaks Resulting from Inadequate Environmental Sanitation—Leslie C. Frank, C.E., Chief, Sanitation Section, U. S. Public Health Service, Washington, D. C.

» » » » » »

Section on Poultry—Wednesday, August 28
(Thomas Jefferson Room)



Left, A. J. Durant, Columbia, Mo., chairman of the Section; right, C. A. Brandly, East Lansing, Mich., secretary.



Morning Session

9:00—Paratyphoid Studies in Turkeys—

R. Fenstermacher, D.V.M., Assistant Professor of Veterinary Medicine, University Farm, St. Paul, Minn., and B. S. Pomeroy, D.V.M., M.S., Instructor in Veterinary Medicine, Veterinary Division, University Farm, St. Paul, Minn.

Experiments in Resistance to Fowl Sarcoma, Strain 13—E. L. Stubbs, V.M.D., Professor of Veterinary Pathology, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa.

Carriers of Hexamite Meleagridis—W. R. Hinshaw, D.V.M., Ph.D., Associate Professor of Veterinary Science, University of California, Berkeley, Calif., and Ethel McNeil, B.A., Ph.D., Associate in Veterinary Science, University of California, Berkeley, Calif.

Swine Erysipelas in Turkeys—E. M. Dickinson, D.V.M., M.Sc., Associate Veterinarian, Oregon Agricultural Experiment Station, Corvallis, Ore., and A. S. Rosenwald, D.V.M., B.Sc., Assistant Veterinarian, Oregon Agricultural Experiment Station, Corvallis, Ore.

Transmission Experiments with Iritis of Fowls—C. D. Lee, D.V.M., M.S., Associate Professor of Veterinary Research, Iowa State College, Ames, Iowa.

The Practitioner's Rôle in Parasite Control—Charles B. Cain, D.V.M., B.S., M.S., Feed Service Director, Royal-Stafolife Mills, Memphis, Tenn.

Afternoon Session

1:30—The Pathology of So-Called Pullet Disease or Blue Comb—Erwin Jung-herr, D.V.M., Ph.D., Professor of Ani-

mal Pathology, University of Connecticut, Storrs, Conn.

Inheritance as a Factor in Poultry-Pathology Research—C. A. Brandly, D.V.M., M.S., Senior Pathologist, Regional Poultry Research Laboratory, East Lansing, Mich., and N. F. Waters, B.Sc., M.Sc., D.Sc., Senior Geneticist, Regional Poultry Research Laboratory, East Lansing, Mich.

Findings in Fowl Paralysis (illustrated)—Norman M. Nelson, D.V.M., M.S., Junior Veterinarian, Bureau of Animal Industry, Regional Poultry Research Laboratory, East Lansing, Mich.

The Nutritional Deficiency Diseases of Chickens—L. C. Norris, B.S., Ph.D., Professor of Poultry Nutrition, Depart-

ment of Poultry Husbandry, Cornell University, Ithaca, N. Y.

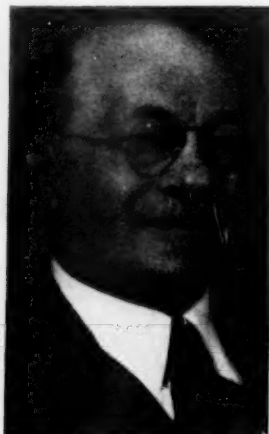
Preventing Poultry Diseases by Management—E. S. Weisner, D.V.M., B.S., M.S., Extension Poultry Pathologist, Michigan State College, East Lansing, Mich.

A Comparative Study of Pullorum Disease in Barred Plymouth Rock and New Hampshire Red Chickens—E. P. Johnson, D.V.M., M.S., Ph.D., Animal Pathologist, Virginia Polytechnic Institute, Blacksburg, Va.

The Transmission of Fowl Leucosis Through Chick Embryos and Young Chicks—Walter J. Hall, D.V.M., Associate Veterinarian, Animal Disease Station, Beltsville, Md.

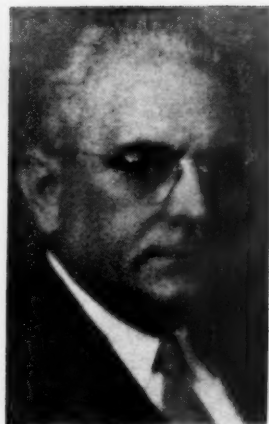
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Committee on Local Arrangements

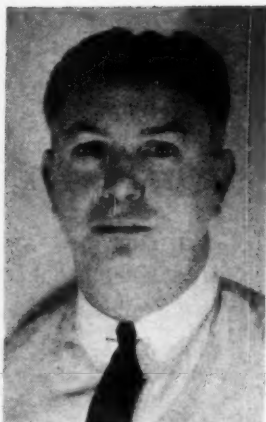


Left (left to right):
John R. Mohler,
chairman; A. Eich-
horn, associate chair-
man; I. M. Cashell,
secretary.

Right (left to right):
Hon. George W.
Gillie, publicity; H.
M. O'Rear, enter-
tainment; H. W.
Schoening, educa-
tional exhibits.



Committee on Local Arrangements—(Continued)



Top row (left to right): Mrs. Clifton D. Lowe, ladies' entertainment; Joseph F. Crosby, technical exhibits, R. A. Kelser, banquet; A. E. Wight, alumni dinners. Bottom row (left to right): W. H. Wright, president's reception; John P. Turner, large animal clinic; Mason Weadon, small animal clinic; Walter J. Hall, poultry and sheep clinic.

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Women's Program

Tuesday, August 27

- 10:00 a. m.—Opening ceremonies.
- 12:30 p. m.—Luncheon.
- 1:30 p. m.—Women's Auxiliary meeting.
- 3:30 p. m.—Card party.
- 6:00 p. m.—Alumni dinner.
- 9:00 p. m.—President's reception.

Wednesday, August 28

- 9:00 a. m.—Sightseeing (western parts of Washington)
- 3:00 p. m.—Motion pictures.
- 7:30 p. m.—General banquet, floor show and dance.

Thursday, August 29

- 9:00 a. m. to 12:00 noon—Optional.
- 1:30 p. m.—Buses to Washington Steamship Company docks.
- 2:00 p. m. to 6:00 p. m.—Boat trip and visit to Mount Vernon and return.
- 7:30 p. m.—Optional.

Friday, August 30

- 9:00 a. m.—Sightseeing (eastern parts of Washington).
- Afternoon—Buses available for trip to Fort Myer, Va., or Beltsville, Md. Luncheon at Beltsville.

Entertainment—Special Sessions—Clinics

Tuesday Evening, August 27

- 6:00—Alumni dinners in charge of President-Elect A. E. Wight. Rooms to be announced.
- 9:00—President's reception and dance. Grand ballroom.

Thursday Afternoon, August 29

- 1:30—Boat trip to Mount Vernon for the entire convention.

Thursday Evening, August 29

- 7:30—House of Representatives, final session.
Report of Executive Board.
- 10:00—Installation of officers and adjournment.

Friday, August 30

- 9:00 a. m.—Clinic and demonstrations at Mayflower Hotel, Fort Myer, Va., and Beltsville, Md.

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Subsidiary Meetings

Virginia State Veterinary Medical Association, Monday, August 26, 2:00 p. m. Room to be announced.

American Society of Veterinary Therapy, Monday, August 26, 2:00 p. m., East Room.

Women's Auxiliary. See page 13.

Extension service veterinarians, breakfast

meeting, Wednesday, August 28, 8:00, Thomas Jefferson Room.

Alpha Psi Fraternity, luncheon meeting, Wednesday, August 28, 12:00. Room to be announced.

American Animal Hospital Association, Thursday, August 29, 9:00 a. m. Room to be announced.

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Washington Hotels and Rates

It is suggested that those planning to attend the convention make their reservations for hotel rooms at an early date. At the Mayflower Hotel, which will be convention headquarters, the rates are as follows: Single room for one person, \$3.50-\$5.00; double room with double bed for two persons, \$5-\$7; double room with twin beds for two persons, \$6-\$9. Surrounding hotels and their rates are:

Hotel	Single	Double Bed	Twins Beds
Lee House	\$3.00	\$5.00	\$6.00
Blackstone	5.00	6.00
New Colonial.....	2.50-3.00	4.00	4.50
Lafayette	2.50-3.00	3.50-4.00	4.00-4.50
Martinique	3.50	...	5.00
Benedick	2.50	3.50	4.00
Willard	3.50	5.00	6.00
Washington	3.50	5.00	6.00
Raleigh	3.50	5.00	6.00
Harrington	3.00	4.00	5.00
Hay-Adams	3.50-5.00	5.00-6.00	6.00-8.00
Roosevelt	3.00-3.50	4.00-5.00	5.00-6.00
Hamilton	4.00	5.00-6.00	6.00-7.00

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To aid in making the alumni dinners on the evening of August 27 one of the happy events of the convention, please declare your intention to attend (naming your alma

mater) at the earliest possible date to President-Elect A. E. Wight, Bureau of Animal Industry, U. S. Department of Agriculture, Washington, D. C.

Exhibitors

ABBOTT LABORATORIES

Abbott Laboratories will display many of their popular veterinary specialties, including Nembutal, Metaphen, Pentothal Sodium, and Nicamin.

CAMPBELL X-RAY CORPORATION

Campbell X-Ray Corporation of Boston, Mass., will exhibit their new 1940 model X-Ray Animagraph, a complete fluoroscopic and radiographic outfit designed specifically for veterinary use.

THE CORN STATES SERUM COMPANY

The Corn States Serum Company will exhibit various products they handle. Part of their booth space will be devoted to a display of the Grogan Kennel, which features a sanitary shield above a removable base pan.

CURTS-FOLSE LABORATORIES

The display of the Curts-Folse Laboratories will include a background of replicas of pharmaceutical labels on a green velvet base upon which a representative grouping of the firm's pharmaceuticals is flanked by instruments and specialties.

CUTTER LABORATORIES

Cutter Laboratories will feature colored motion pictures of the field use of their BTV and Crystal Violet Vaccine for hog-cholera immunization. Other biological products and specialties, such as Gonadin, will be displayed, and the new Cutter vacuum blood-transfusion outfit will be demonstrated. Motion pictures of the blood-transfusion technic developed by Cutter Laboratories will be shown at regular intervals.

THE DOHO CHEMICAL CORPORATION

Auralgan, a product widely used in cases of canker, otorrhea and ear mites, will be displayed by The Doho Chemical Corporation.

EISELE & COMPANY

Eisele & Company will display their new veterinary rust-free suture needles, together with their regular line of hypodermic syringes, clinical thermometers and Eco veterinary needles. They also will exhibit a new device for Luer syringes which locks needles with a rear bead. Elastic bandages without rubber, ground plunger all-glass syringes with catheter tips, surgeons' blades and handles, dose syringes, Lacteat tubes and Trap Air Milking tubes are among the other specialties to be featured.

FORT DODGE LABORATORIES, INC.

Fort Dodge Laboratories, Inc., will present the latest advancements in vitamin therapy, such as B-complex tablets, vitamin C tablets, nicotinic acid for hypodermic and oral administration, and thiamin chloride. A number of new Fort Dodge pharmaceuticals will be exhibited for the first time, including Cap-Tabs, which are bolus-shaped tablets. Biological products also will be given prominent display.

THE HAVER-GLOVER LABORATORIES

The Haver-Glover Laboratories will exhibit their general line of veterinary supplies: biological products, pharmaceuticals and surgical instruments.

JENSEN-SALSBERY LABORATORIES, INC.

Jensen-Salsbery Laboratories, Inc., will display a complete line of surgical instruments, biological products and pharmaceuticals. Featured among the firm's new items will be equipment for artificial insemination and for intradermic vaccination. The biological line will comprise encephalomyelitis vaccine for both subcutaneous and intradermic use, and fowl-pox vaccine prepared from pigeon strains. Pharmaceuticals to be exhibited are phenothiazine and phenite, the new anthelmintic for nodular disease; Stibsol, an anthelmintic for heartworms in dogs; Halatal, a barbituric an-

esthetic agent; Toxital, a toxic barbiturate for destroying pets; and other merchandise listed in the 1940 edition of the firm's catalogue, which was recently mailed to all qualified veterinarians.

LEDERLE LABORATORIES, INC.

Lederle Laboratories Inc., will feature distemper, encephalomyelitis and hog-cholera products. Color transparencies of various scenes at the laboratories where these products are manufactured are to be shown on a three-way revolving display cabinet. The center of attraction at the exhibit will be a photomontage of laboratory scenes surrounding an enlarged airplane view of the Lederle biological laboratories at Pearl River, N. Y.

MERCK & Co., INC.

The Merck booth will portray the prominent rôle of the Merck research laboratories in elucidating the chemical nature of vitamins. The exhibit will give special emphasis to the vitamin B complex, and pure crystals of vitamin B₁, riboflavin, nicotinic acid, vitamin B₆ and pantothenic acid will be available for examination. Information on the requirements of the various species of animals for these vitamins will be furnished. Pathological manifestations in experimental animals due to specific vitamin deficiencies will be shown in gross pictures and photomicrographs.

A selected group of medicinal chemicals useful in veterinary medicine will be shown under the Merck label. Literature on Canex and Lentin and a Merck veterinary service bulletin will be distributed.

JOHN MORRELL & Co.

The purposes of the Red Heart dog-food display, presented by John Morrell & Co., are to tell veterinarians about Red Heart—to explain the development of the product and the principles which govern its manufacture—and to show the manner in which the firm works to maintain close relations with the veterinary profession.

The display will consist of a large center panel bearing an illuminated red heart

flanked by two smaller panels decorated with enlarged prints of Red Heart advertisements currently appearing in veterinary publications.

Particular emphasis will be placed on Red Heart's three flavors (beef, fish and cheese) and on the value of federally inspected dog foods. Also, families of rats will be exhibited, along with data pertaining to specific generations. These rats, since birth, have been fed exclusively on Red Heart and water, and their condition bears important evidence of excellent nutritional results. W. O. Henson, director of nutritional research, will be in charge.

NORDEN LABORATORIES

Norden Laboratories' display will feature Norden Certified biological products, triple-tested anti-hog-cholera serum and virus, and pharmaceuticals, with emphasis on guarantee of care in manufacture and assurance of safety in use. A portion of the exhibit will be devoted to instruments.

PITMAN-MOORE COMPANY

Pitman-Moore Company, a division of Allied Laboratories, Inc., will give prominence in its exhibit to the efficiency, based on discoveries of the federal bureau of animal industry, of n-butyl chloride as an anthelmintic. The company's brand of this new chemical compound, Buchlorin, will be exhibited in several dosage forms. Another new anthelmintic, also developed by the federal bureau of animal industry, to be featured in the Pitman-Moore booth is phenothiazine.

Among other chemical compounds to be displayed are sulfapyridine and ethylenediamine dihydroiodide. The latter, offered under the brand name HI-Amine, is a discovery of the Pitman-Moore laboratories.

A portion of the exhibit will be devoted to the company's model laboratories for the production of encephalomyelitis vaccine (chick).

SHARP & DOHME

Sharp & Dohme will feature an interest-

ing exhibit of their pharmaceutical and biological products, together with literature on these items. The Mulford laboratories of Sharp & Dohme produce a complete line of veterinary biological products, the more important of which will be included in the display. In addition, there will be pharmaceutical specialties, such as Caprokol pills, B.F.I. and B.F.I. uterine capsules, Hexylresorcinol solution S. T. 37, Cremono-Carbonates, B-G-Phos, Pabutole and a number of other vitamin products.

R. J. STRASENBURGH CO.

R. J. Strassenburgh Co., which has been serving the veterinary profession for the past 54 years, will feature Utabs, a distinctive pharmaceutical developed in the Strassenburgh research laboratories. Information concerning the company's line of pharmaceuticals will be available at the exhibit.

SWIFT & COMPANY

Swift & Company, manufacturers of Pard dog food, will for the eighth consecutive year have an attractive and novel exhibit.

WILSON & CO.

For the seventh consecutive year, Wilson & Co. will participate in the annual meeting. A large, colorful, mechanical display featuring the ingredients and quality of Ideal dog food will be the principal attraction. Emphasis will be given to the extensive research work in connection with the nutritional value of Ideal dog food and the careful testing of the ingredients used in its manufacture.

Mr. Smith, manager of the Ideal dog food division of Wilson & Co., will be in attendance, and assisting him will be John M. Eagle, who is the eastern representative of the division.

Reports on nutritional tests conducted at the Wilson Foundation and literature of a general nature on Ideal dog food will be available.

WINTHROP CHEMICAL COMPANY, INC.

Winthrop Chemical Company, Inc., will exhibit their original synthetic pharmaceutical products for the treatment of large and small animals. Among the products to be featured are Neoprontosil; Betaxin, the first synthetic vitamin B₁; Nemural and Fuadin, tapeworm and heartworm treatments, respectively; Novocain, the first procaine hydrochloride for local anesthesia; Omadin, a lipoid-protein compound for nonspecific therapy; Istizin, a nongripping laxative; Aricyl, a rapidly acting arsenical tonic; and Zephiran, an antiseptic with high germicidal potency.

OTHER EXHIBITORS

Firms other than those listed above which will exhibit at the annual meeting are Bauer & Black; Becton, Dickinson & Co.; General Electric X-Ray Corporation; General Mills, Inc.; Ashe Lockhart, Inc.; Veterinary Magazine Corporation; and Judy Publishing Company.

Poultry at the Washington Session

Conforming to the growing desire to bring the veterinary profession closer to the nation's poultry industry, Professor Rice of Cornell University, who is known as the father of modern poultry production, will open one of the general sessions with an address on the rôle of veterinary science in the development of that industry and Cliff D. Carpenter, chairman of the Committee on Poultry, will open the discussion with a paper entitled "But What About Poultry?" The record these two gentlemen inscribed in the archives of the AVMA at the World's Poultry Congress at Cleveland in 1939 is the assurance that the poultry branch of the service is keeping step with the other units of organized veterinary medicine.

Despite the great development of medicine in recent times the mechanism of causes, effects and cures remains incomplete. While medicine goes on looking into new fields, it leaves behind many details to be cleared up by the chemist and biologist.

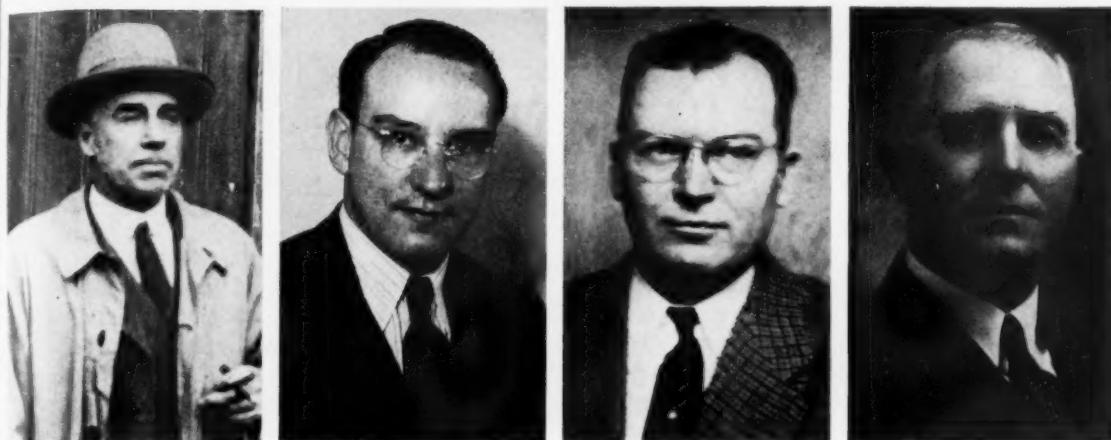
Organization of the House of Representatives (as of June 1940)

	<i>Delegate</i>	<i>Alternate</i>
Alabama	I. S. McAdory	McKenzie Heath
Arizona	T. B. Jones	J. B. McQuown
Arkansas	C. D. Stubbs	R. W. Williams
California	Hugh S. Cameron	Oscar J. Kron
Colorado	Thos. E. Traylor	Ronald M. Gow
Connecticut	F. F. Bushnell	George E. Corwin
Delaware	C. C. Palmer	
District of Columbia	Mason Weadon	A. E. Wight
Florida	J. L. Ruble	
Georgia	J. L. Hopping	M. J. Rattray
Idaho	A. K. Kuttler	H. R. Groome
Illinois	David E. Sisk	L. A. Gray
Indiana	J. L. Axby	Frank H. Brown
Iowa	F. M. Wilson	P. V. Neuzil
Kansas	S. L. Stewart	M. P. Schlaegel
Kentucky	D. E. Westmorland	Allen S. Barnes
Louisiana	J. Arthur Goodwin	Henry H. Baur
Maine	J. F. Witter	Laurence H. Batchelder
Maryland	A. L. Brueckner	Mark Welsh
Massachusetts	L. A. Paquin	Wm. H. Dodge
Michigan	B. J. Killham	E. C. W. Schubel
Minnesota	L. Eugene Stanton	Harry Hedin
Mississippi	R. H. Stewart	O. M. Norton
Missouri	A. T. Kinsley	Hugh E. Curry
Montana	H. F. Wilkins	G. W. Cronen
Nebraska	Floyd Perrin	I. W. McEachran
Nevada	Edward Records	Lyman R. Vawter
New Hampshire	Carl L. Martin	
New Jersey	R. A. Hendershott	Chas. J. McAnulty
New Mexico	F. L. Schneider	H. E. Kemper
New York	R. R. Birch	L. E. Moore
North Carolina	A. A. Husman	J. H. Brown
North Dakota	F. M. Bolin	C. H. Hofstrand
Ohio	Reuben Hilty	Walter R. Krill
Oklahoma	H. Wood Ayers	John T. Wilson
Oregon	O. H. Muth	R. W. Dougherty
Pennsylvania	W. H. Ivens	G. A. Dick
Rhode Island	J. S. Barber	Thomas E. Robinson
South Carolina	Wm. A. Barnette	B. C. Talley
South Dakota	George E. Melody	Carl H. Fauks
Tennessee	O. B. Neeley	Dennis Coughlin
Texas	M. B. Starnes	M. E. Gleason
Utah	*N. C. Spalding	Hugh Hurst
Vermont	J. J. Staab	G. N. Welch
Virginia	H. T. Farmer	E. P. Wilson
Washington	V. C. Pahlman	E. E. Wegner
West Virginia	S. E. Hershey	H. M. Newton
Wisconsin	James S. Healy	W. Wisnicky
Wyoming	L. H. Scrivner	H. D. Port
Veterinary Corps	Col. R. A. Kelser	Col. Burton A. Seeley
†NABAIV	H. M. O'Rear	G. E. Mitchell
Ontario	H. R. Potter	W. J. Rumney
British Columbia	G. Donald Pinder	Thomas H. Jagger
Manitoba	R. H. Lay	Harry H. Ross
Alberta	J. C. Hargrave	Percy R. Talbot

*Died June 16, 1940.

†National Association of Bureau of Animal Industry Veterinarians.

*New Members of the House of Representatives**



Top row (left to right): J. C. Hargrave, Alberta; C. C. Palmer, Delaware; J. L. Ruble, Florida; S. L. Stewart, Kansas. Middle row (left to right): J. Arthur Goodwin, Louisiana; J. F. Witter, Maine; R. H. Lay, Manitoba. Bottom row (left to right): Edward Records, Nevada; F. M. Bolin, North Dakota; O. B. Neeley, Tennessee; V. C. Pahlman, Washington.

*In the March 1940 issue (pp. 382-387) the portraits of the members of the House, as of February 1940, were reproduced. With the exception of J. F. Witter of Maine and R. H. Lay of Manitoba, whose portraits were not available for the March issue, the men pictured on this page were elected since February 1, 1940.

The Treatment of Streptococcic Mastitis by Infusion of the Udder with Entozon*

By O. W. SCHALM,† D.V.M., M.S., Ph.D.

Berkeley, Calif.

Streptococcus agalactiae is recognized as the causative agent of a form of mastitis which is prevalent in dairy herds throughout the world. Certain investigators^{1, 2} have stated that this infecting agent may be responsible for as high as 90 per cent or more of the mastitis in some herds. This organism enters the udder through the teat canal; thus, the most favorable time for its spread is during milking. In herds where infected and clean animals are milked indiscriminately, the udders of the latter are exposed daily to the streptococci which are brought to them on the hands of the milkers or on the cups of the milking machine. In three herds under the writer's supervision, in which little or nothing was being done to control mastitis, the incidence of infection with *S. agalactiae* exceeded 50 per cent in each case.

It has been adequately demonstrated by a number of research workers^{3, 4, 5, 6} that infections of the udder with *S. agalactiae* can be greatly reduced and eventually eliminated from a herd through a program of segregation supplemented by certain sanitary practices. The success of a control

program depends upon the thoroughness with which the unaffected udders are protected from contact with the streptococci. As long as animals harboring this organism remain in a herd even though kept segregated, the disease may spread anew, unless constant vigilance is maintained; therefore, it is to the advantage of the dairyman to eliminate such cows as rapidly as possible. Many infected animals, however, continue to produce a satisfactory amount of milk for some time and, for that reason, it is not an economical procedure to dispose of them immediately. If a method of treatment could be employed that would completely remove the streptococci from the udders, the disease could be more quickly and certainly eradicated from a herd.

Many different chemicals have been recommended for use in the treatment of streptococcic mastitis. They have been administered by the mouth, intravenously, and even by direct injection or infusion into the udder. The results, for the most part, have been discouraging, for the agents used have failed to permanently rid the udder of the offending organisms. As a result of these failures, the opinion is now generally prevalent in this country that chronic streptococcic mastitis is incurable.

During the past 17 years, a number of European investigators have been treating mastitis by infusion of the udder with certain acridine derivatives. In 1923, Bugge⁷ reported good results from irrigating the udder in a case of streptococcic mastitis with an acridine derivative called "rivanol" (2-ethoxy-6, 9-diamino-acridine), which he used in a concentration of 1:1,000 in 5 per cent salt solution. In other cases in which the etiology was not proved, the in-

*Assistance in the preparation of these materials was furnished by the personnel of W.P.A. Project O. P. No. 665-08-3-29.

†Veterinary Science Division, University of California.

¹Udall, D. H., and Johnson, S. D.: The Diagnosis and Control of Mastitis. Cornell Univ. Agr. Exp. Sta. Bul. 579 (1933).

²Bryan, C. S.: Mastitis. Michigan State Col. Ext. Bul. 165 (1936).

³Minett, F. C., Stableforth, A. W., and Edwards, S. T.: Studies on Bovine Mastitis. VIII—The Control of Chronic Streptococcal Mastitis. Jour. Comp. Path. and Therap., xvi (1933), pp. 131-138.

⁴Stableforth, A. W., Edwards, S. J., and Minett, F. C.: Studies on Bovine Mastitis. XI—Further Observations on the Control of Chronic Streptococcal Mastitis. Jour. Comp. Path. and Therap., xlviii (1935), pp. 300-315.

⁵Plastring, W. N., Anderson, E. O., Weirether, F. J., and Johnson, R. E.: Infectious Bovine Mastitis. Report on a Control Program Based on Segregation of Infected Animals. Jour. Dairy Sci., xix (1936), pp. 641-650.

⁶Schalm, O. W.: The Control of Streptococcal Mastitis in a Certified Dairy. Presented at the 32nd Annual Convention of the International Assoc. of Milk Dealers (1939).

⁷Bugge, R.: Chemotherapeutische Antiseptika. Deren Erforschung im letzten Dezenium mit besonderer Berücksichtigung von Morgenroths "Rivanol." Deut. Tierärz. Wchnschr., xxxii (1924), p. 8.

flammation was quickly cured by rivanol, but a decrease in milk production was observed and, in some instances, the treated quarters became atrophied. Schnorf,⁸ in 1925, compared several acridine derivatives and concluded that "uberasan," a derivative of rivanol, met the requirement of rapid sterilization of the diseased quarter while preserving the milk flow to the greatest extent. He estimated that 90 per cent of the cases of streptococcic mastitis are curable if treatment is begun at the right time. Rivanol and uberasan have been used by a number of individuals. Although the majority have recommended this new acridine therapy and have claimed as high as 50 to 90 per cent cures, some have considered it of little or no value.

Following this early work, a new compound called "entozon" was developed. It consists of a mixture of rivanol lactate, a nitro-acridine, amyl saccharine and sodium biborate. The formula as given by the manufacturer is as follows:

2, 3-dimethoxy-6-nitro-9-(γ -diethyl-amino-B-oxypropylamino) acridine dihydro-chloride	5.88 per cent
2-ethoxy-6, 9-diamino-acridine lactate	29.44 per cent
Amyl saccharine	58.80 per cent
Sodium biborate	5.88 per cent

In a concentration of 1:1,250, it is claimed to be almost completely nonirritating and to exhibit a hydrogen-ion concentration which is optimal for the tissues.

In 1933, Seelemann⁹ reported very favorable results with entozon. He treated over 800 quarters on approximately 300 cows in six herds. He used 500 to 1,500 cc. of warm 1:1,250 entozon solution per quarter, depending upon its capacity. With lactating cows, the fluid was milked out after a lapse of from three to five minutes, while with dry cows it was left in overnight. Two treatments were given a week apart, after which the milk was again studied bacteriologically for streptococci. In some instances, three and even four treatments

were necessary before complete sterilization was accomplished. A few cows were incurable.

In 1934, Trautwein, Weisshaupt and Wagner¹⁰ reported their results with entozon. They employed the same methods as Seelemann in treating 326 cows in 34 herds. A total of 856 diseased quarters were infused, and of this number, 41 required one treatment, 539 required two, 128 required three, 16 required four, and nine required five treatments to free them of streptococci. Of the 326 cows, 265, or 81 per cent, were cured; or, of the 856 quarters receiving treatment, 733, or 85 per



Fig. 1. A simple infusion apparatus, consisting of a graduated liter bottle to which a gravity-flow, intravenous injection hose is attached.

cent, were freed of the infecting streptococci.

Seit,¹¹ in 1934, reported phenomenal success with entozon used during late lactation and on dry cows. Of 100 cows treated, only eight had to be rejected after

⁸Schnorf, C.: Chemotherapie der Katarrhischen Unterentzündungen, Speziell des gelben Galtes. Berl. Tierärztl. Wehnschr., xli (1925), pp. 597-602.

⁹Seelemann, M.: Die Durchführung der Geltebekämpfung undbehandlung in der Praxis. Deut. Tierärztl. Wehnschr., xli (1933), pp. 337-345.

¹⁰Trautwein, K., Weisshaupt, A., and Wagner, H.: Erfahrungen mit der Entozonbehandlung in Galtbeständen. Deut. Tierärztl. Wehnschr., xlii (1934), pp. 736-742.

¹¹Seit, B.: Foreløbig Meddelelse om Behandling af Streptokok-Mastitis hos køen med Entozon—Opøsning. Maanedsskrift for Drylaeger, xlii (1934), pp. 257-264.

calving as not being cured. He infused 500 to 1,000 cc. per quarter, leaving it in from five to 15 minutes, depending upon the degree of mastitis. Three such infusions were made on successive days.

Entozon has been recommended by a number of other investigators as an excellent curative for streptococcic mastitis. The method of administration was varied somewhat by the different individuals. All agree, however, that the udder must be

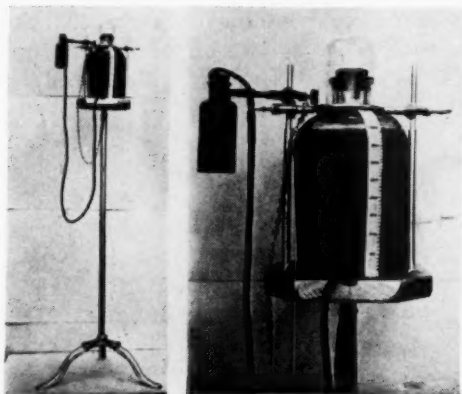


Fig. 2. A 4-liter infusion apparatus with stand. Note small alcohol bottle to immerse teat tube in between infusions.

completely milked out prior to making the infusion, for milk or inflammatory exudates precipitate the acridine derivatives and thus reduce the efficiency of the solution. In general, the method of treatment was as follows: A preliminary rinse of 100 to 200 cc. of entozon solution was infused. After a short massage, this was withdrawn and replaced by 500 to 1,500 cc. of a 1:1,000 to 1:1,500 concentration of entozon in warm water. This principal infusion was left in lactating udders from three minutes to three hours and in dry udders from ten to 24 hours by the different investigators. At least two infusions, to be given on consecutive days or a week apart, were recommended. Distilled water is advocated by the manufacturer of entozon, but many of the reports indicate that boiled, filtered tap water can be used without ill effects.

In 1929, Steck¹² began his extensive investigation on the acridine therapy of mas-

titis. He compared rivanol, uberasan, entozon and trypaflavin with regard to their lethal effect upon the streptococci and their irritating properties on the tissues. He concluded that, if solutions of equal irritative action were compared, trypaflavin showed decidedly the greatest bactericidal action. While it was superior to the others in a secretion which was but slightly altered, entozon, on the other hand, gave somewhat better results when the secretion was of a purulent nature, trypaflavin ranking second.

In 1938, Stableforth and Scorgie¹³ reported on their investigations with entozon (1:1,250) and acriflavine (1:10,000), using two treatments given a week apart. With lactating cows the solutions were left in the quarters for five minutes and with dry cows for 24 hours. They concluded that acriflavine was to be preferred.

Udall,¹⁴ in this country, has used trypaflavin (1:4,000) in some herds. He states that the results to date indicate that it may be highly useful.

In February 1939, the author began his studies on acridine therapy for mastitis. Both entozon and trypaflavin have been used. Since the investigations on the latter are still in progress, this report will be confined to a presentation of the results thus far obtained with entozon.*

INFUSION APPARATUS

The essential parts are a bottle graduated in cubic centimeters, rubber tubing and a teat tube. A liter bottle to which is attached an intravenous outfit, with a teat tube substituted for the needle, is perhaps the simplest form of equipment (fig. 1). A more elaborate apparatus is shown in figure 2, consisting of a 4-liter bottle, with an outlet at the bottom to which the rubber tubing is attached. The advantage of this equipment is that it holds sufficient fluid to treat all quarters of an udder without refilling.

*Entozon is not available commercially in the United States. Through the courtesy of C. E. Fanslau of the Winthrop Chemical Company, New York City, this compound was placed at our disposal.

¹²Stableforth, A. W., and Scorgie, N. J.: Entozon and Acriflavine for the Treatment of Chronic, Contagious Bovine Mastitis. *Vet. Rec.*, 1 (1934), pp. 663-676.

¹⁴Udall, D. H.: *The Practice of Veterinary Medicine*, 3rd edition (1939).

¹²Steck, W.: The control of *Streptococcus agalactiae* Mastitis. *Proc. 12th Int. Vet. Cong.*, II (1934), pp. 494-505.

However, a stand to support the bottle is necessary.

INFUSION TECHNIC

In a preliminary trial on six cows, boiled, filtered tap water was used as a vehicle for the entozon on three, and distilled water on the remainder. No differences in reaction were noted between the two groups; therefore, tap water was used for all subsequent treatments. Since the acridine derivatives are subject to deterioration, especially if exposed to light, it seemed advisable to use only freshly prepared solutions. Therefore, the infusion fluid was made up at the dairy immediately prior to use. Warm, sterile water was transported to the dairy in gallon jugs. A 1:1,250 entozon solution was prepared by adding 0.8 Gm. (12 gr.) of the compound to one liter of water.

In making the infusion, care was taken to prevent the introduction of bacteria into the udder from the outside. Although entozon is lethal for streptococci, it can not be depended upon to sterilize the equipment, for it apparently does not destroy all types of bacteria. The equipment should be sterilized before use and, if a number of animals are to be treated at the same visit, care must be taken to keep it free from contamination.

A single milk tube was used for all cows. Between the infusion of every quarter, it was kept immersed in 70 per cent alcohol containing sufficient tincture of iodine to impart an amber color. The manner in which this was done is shown in figure 2.

The udder was washed with a chlorine solution containing approximately 400 p.p.m. of available chlorine, and iodized alcohol was applied to the tip of the teat immediately prior to making each infusion. A preliminary rinse, consisting of 200 cc. of entozon solution, was infused into the thoroughly milked-out quarter. After massaging the cistern, this was withdrawn and immediately replaced by the principal infusion, the amount of which was varied between 400 and 2,300 cc., depending on the capacity of the quarter. On an average,

800 cc. was employed. With lactating cows, the principal infusion was left in the udder for periods of time varying between 45 minutes and three hours, with an average of one hour. In the case of cows in late lactation or dry cows, it was left in overnight. The after care consisted of thoroughly milking out the udder twice daily. With cows that were being dried up, this was continued until the secretion was devoid of large particles.

HERD MANAGEMENT

The herd in which this work was done consisted of approximately 200 mature cows, of which number an average of 150 were kept in lactation. During 1937, 56 cows were eliminated because of mastitis or poor production. The milk of 31 of these was studied bacteriologically and, in each instance, *S. agalactiae* was isolated from one or more quarters. In the following year, 42 cows were eliminated, and of this number, 40, or 95 per cent, were infected with *S. agalactiae*. Six months prior to initiation of the entozon treatments, a mastitis-control program was instituted as follows: A composite milk sample was collected from each cow in lactation at monthly intervals. All animals found to be shedding *S. agalactiae* were placed in a single group and were segregated from the remainder of the herd during lactation. Due to lack of pasture facilities, all dry cows were kept together. Milking machines were used and the same men handled both groups of cows, but the infected animals were always milked last.

BACTERIOLOGICAL TECHNIC

For the bacteriological investigations, 1 cc. of a 1:100 dilution of milk was plated with veal-infusion agar containing from 5 to 7 per cent fresh horse or ox blood. After 24 and again after 48 hours at 37° C., the plates were examined and colonies suspected of being streptococci were transferred to serum broth and incubated overnight. Gram-stained smears were prepared the following day and studied microscopically. Cultures proving to be streptococci

were transferred to the following differential media for final classification: methylene-blue milk in concentrations of 1:5,000 and 1:20,000, 0.1 per cent esculin broth, 1 per cent sodium hippurate, litmus milk, lactose, sucrose, salicin, mannite, raffinose, inulin, sorbitol, trehalose, arabinose, glucose and maltose. In addition to the blood-agar plate test, all milk samples were incubated overnight at 37° C. The next morning smears were prepared, stained by the Broadhurst-Paley¹⁵ method, and examined microscopically for streptococci.

ENTOZON TREATMENTS

The majority of the cows with advanced mastitis had been eliminated from this herd before treatments with entozon were begun. The remaining infected animals were producing a satisfactory amount of milk and either had not advanced to the stage of showing symptoms of mastitis or had exhibited symptoms intermittently.

The purpose of the treatment was to completely eliminate *S. agalactiae* from the infected udders; therefore, the infusions were repeated at intervals of from seven to 14 days until this organism could no longer be demonstrated in the udder secretion. To insure elimination of any undetected latent infections in nonshedding quarters, all quarters of each treated cow were infused. Following treatment, milk samples from the individual quarters were collected at weekly intervals for bacteriological study. When *S. agalactiae* could no longer be demonstrated, the lactating cows were transferred to milking strings composed of unaffected cows, and the dry animals were turned out to pasture. A composite milk sample was obtained once a week from each treated cow returned to the milking strings.

The history of each cow, the method of treatment and the results obtained are presented in the table. For convenience, the cows have been numbered consecutively from 1 to 22. Three fresh cows, eight cows in their second to sixth month of lactation and eleven cows that were being dried up received udder infusions with

entozon. A total of 61 quarters shedding *S. agalactiae* and 27 nonshedding quarters were treated.

RESULTS WITH LACTATING COWS

At the time of treatment, the eleven lactating cows had a total of 28 quarters shedding *S. agalactiae*, of which number, nine, or 32 per cent, gave a positive strip-cup test, and with 16, or 57 per cent, the pH of the foremilk was 7 or above, as indicated by the brom-cresol-purple paper test. Besides this, the fore milk of one nonshedding quarter was positive to the strip cup and that of six other nonshedding quarters was alkaline.

Following treatment with entozon, *S. agalactiae* completely disappeared from these udders. Sixteen quarters responded to one infusion, two quarters to two, six quarters to three and four quarters to four infusions, given at intervals of seven to 14 days. The number of weekly tests for streptococci, which have been made since completing the treatments, range from seven to 45 with the different animals. Cows 5, 8, 9, 10 and 11 finished out their lactation period, were dried up and have calved again. Four of them are still free of infection with *S. agalactiae*, but this organism reappeared in all quarters of cow 10 in the third week of the new lactation period. Whether this represents a relapse or a reinfection is not known. This cow had not shed *S. agalactiae* during the 20 weeks which elapsed following treatment and prior to going dry. She had had some contact with infected cows while dry. Cow 11 developed mastitis in the right front quarter in the fourth month of the new lactation period. The weekly bacteriological study on the milk from this quarter revealed it to be infected with *S. uberis*.

Cow 6 represents the only case of acute streptococcic mastitis treated. She was shedding enormous numbers of streptococci from all quarters and the fore milk of three quarters consisted of a liquid pus. Four treatments at 14-day intervals were required to completely rid the udder of its infection. In the third and fourth treatments, a 1:1,000 concentration of entozon was used and left in overnight.

¹⁵Broadhurst, Jean, and Paley, C.: A. Single Dip Stain for the Direct Examination of Milk. J.A.V.M.A., xciv (1939), pp. 525-526.

Cow histories, method of treatment and results obtained with entozon.

Cow No.	No. of Calves	Mos. of Lact.	Approx. Duration Infection.	Method of Treatment			Tests on Quarter Samples Before and After Treatment ²						No. of Weekly Tests After Treatment Neg. for S. Agalactiae
				Times Treated	Vol.	Time Left in ¹	Strip Cup		B. C. P. Test for pH		Shedding S. Agalactiae		
			Mos.		cc.	Hrs.	B	A	B	A	B	A	
1	2	1	10	1	700	1	0	0	0	0	a, c, d	0	36
2	3	1	3	3	800-1500	1-3	b	b	b, c	b	a, c, d	0	32 ³
3	2	1	3	2	800	1	a, b	0	a, b	0	a, b	0	7
4	2	2	3	3	800-1000	3-O. N.	0	0	b	d	a, c, d	0	31 ⁴
5	5	2	9	1	700	1	0	0	d	d	b, c	0	34 ⁴
6	2	3	3	4	700-1000	2-O. N.	a, c, d	0	a, c, d	0	All	0	24
7	2	4	3	1	700	1	a, b, d	0	a, b, d	0	a, b, d	0	45
8	3	4	15	1	600	1	0	0	a, b	0	a, b	0	35
9	4	5	5	1	800	¾	0	0	a, b, d	0	c	0	25
10	1	6	5	1	800	1	0	0	All	0	All	0	22
11	4	6	10	1	800	1	a	0	a	0	a	0	36
12	3	Dry	8	2	700	O. N.	All	0	All	0	a, c, d	0	40
13	2	Dry	14	2	700	O. N.	All	0	All	0	All	0	45
14	2	Dry	9	2	700	O. N.	a, d	0	All	0	a, c, d	0	40
15	8	Dry	24	4	700	O. N.	All	0	All	c, d	All	a, c	0
16	2	Dry	9	3	400-700	O. N.	a, c, d	0	All	0	a, c, d	0	16 ⁵
17	3	Dry	3	3	700	O. N.	a	0	a	0	a, d	d	22
18	4	Dry	13	1	800	O. N.	0	0	c	a	a, c, d	0	6 ⁵
19	3	Dry	9	2	800	O. N.	All	0	All	0	a, c	0	30
20	5	Dry	3	1	750	O. N.	0	0	All	0	a	0	34
21	2	Dry	5	2	500-800	O. N.	a, b, d	0	All	0	All	0	29
22	5	Dry	20	2	800-2300	O. N.	All	0	All	0	All	a, c	8 ⁶

¹O. N.—Overnight.²B—Results of tests before treatments.

A—Results of tests before treatments.

O—Indicates a normal reaction of the milk of all quarters.

a—Right front quarter gave positive test.

b—Right rear quarter gave positive test.

c—Left front quarter gave positive test.

d—Left rear quarter gave positive test.

³Right rear quarter dried up.⁴Left rear quarter underwent partial atrophy.⁵Freshened with right rear teat occluded by scar tissue.

The results of the strip-cup and the brom-cresol-purple paper tests during the first three weeks after treatment are not included in this table.

Cow 4 developed a firm left rear quarter following the third infusion of entozon and finally this quarter underwent partial atrophy. The left rear quarter was still shedding as many as 60,000 streptococci per cc. of milk seven days after the second treatment. The third infusion was left in this quarter overnight instead of three hours as in the case of the remaining quarters. Cow 5 also reacted unfavorably to treatment, for her left rear quarter underwent partial atrophy after only one infusion. In the next lactation period, however, this quarter, although still somewhat smaller than the opposite rear quarter, was well developed and gave a satisfactory quantity of normal milk. The right rear quarter of cow 2 completely dried up following treatment; three infusions had been given.

RESULTS WITH COWS BEING DRIED UP

The eleven cows in this group had a total of 33 quarters shedding *S. agalactiae*, and, of this number, 26, or 78 per cent, gave positive strip-cup tests at the time treatment was given. Besides this, three non-shedding quarters also showed visible particles in the fore milk. Since the secretion of the normal udder becomes alkaline when being dried up, the high incidence of alkaline secretion in this group of cows as shown in the table has no special significance.

Following treatment, *S. agalactiae* completely disappeared from the udders of eight out of the eleven dry cows. The number of infusions given per quarter was as follows: four quarters, one time; 20 quarters, two times; five quarters, three times; and four quarters, four times. *S. agalactiae* was again found in the milk from two quarters of cow 15, in one quarter of cow 17, and in two quarters of cow 22 after calving. Cow 15 was sold as incurable, since her udder showed advanced fibrosis in all quarters and she had been given four infusions. Cow 17 shed *S. agalactiae* intermittently from the left rear quarter after freshening, for it has been isolated in five out of 27 weekly tests. The front quarters of cow 22 have shed this organism continuously since the third week after calving. Of

the 33 infected quarters on these dry cows, 27, or 81.8 per cent, were cured. The eight cows from which streptococci have not been isolated since treatment have been tested weekly for periods of time varying from six to 45 weeks with the different animals.

Cows 16, 18 and 22 each freshened with the right rear teat nonfunctional. The parenchyma in each case was well developed but there appeared to be complete obliteration of the teat lumen by scar tissue. It is thought to be merely coincidental that the same quarter on each cow was involved. Cow 18 had received one infusion, cow 22, two, and cow 16, three infusions.

REACTION FOLLOWING TREATMENT

The reaction of the udder to infusion with entozon varied considerably with individual cows. A variable degree of firmness and swelling usually developed within a few hours and persisted for several days. The secretion at first was greatly decreased, became alkaline, was tinged with yellow for several days and contained a variable number of visible particles, ranging from a few millimeters to as large as 20 mm. in length. The larger particles in some cases were tinged with blood. Usually within seven to 14 days, but in some instances not until after 21 days, the udder and its secretion returned to normal. The exceptions were as follows: The secretion of the right rear quarter of cow 2 became watery and finally dried up; the fore milk of the partially atrophied quarters of cows 4 and 5 remained alkaline and, after calving, the left front and left rear quarters of cow 15 and the right front quarter of cow 18 produced an alkaline secretion during the first week.

Milk production was not seriously affected except perhaps in those cases where a quarter was permanently damaged. With lactating cows, milk production was usually slightly below the pre-treatment level, the amount of decrease being somewhat proportional to the number of infusions given. Production returned to normal in the following lactation period in the cases of the cows that calved again. The cows treated at the end of their lactation

period freshened with well-developed udders and gave a normal amount of milk. In some instances production was greater than in previous lactations.

In a few quarters, secondary infections with micrococci and other organisms were observed following treatment, in spite of the fact that every precaution was taken to prevent introduction of bacteria from the outside. It is felt that some of these cases could be attributed to the rapid multiplication of bacteria already established in the quarter which survived the treatment. This certainly can happen with the streptococci, for in several instances these organisms were shed in far greater numbers after treatment than before. It appears that if the streptococci are not completely destroyed by the first infusion, in some cases the accompanying irritation to the udder reduces its resistance to a point where the streptococci multiply unhindered. It is important, therefore, to make a bacteriological study of the udder secretion one week after the first infusion to determine whether further treatment is necessary.

SUMMARY

Entozon, a compound composed of a nitro-acridine, rivanol lactate, amyl saccharine and sodium baborate, is highly lethal to *S. agalactiae*. During the past decade, various European investigators have used it with phenomenal success, in the form of an udder infusion, for the treatment of streptococcic mastitis. In the therapeutic concentration of 1:1,250, it is relatively nonirritating and is capable of destroying *S. agalactiae* in vivo. The number of infusions required to bring about complete removal of the streptococci varies with individual cows. Factors which influence the efficiency of the treatment are the stage of lactation, the nature of the secretion and the degree of fibrosis. Milk and exudates precipitate the acridine derivatives and thereby reduce the effectiveness of the infusion. In cases of acute mastitis where considerable exudate remains in the udder even after thorough milking, a concentration of 1:1,000 is recommended. When lactating cows are

treated, the milk is not suitable for human use for a period of one to three weeks. This milk loss may be prevented by treating cows in late lactation or when dry. The milk of treated lactating cows may be fed to calves until it returns to normal.

The infusion was made by gravity pressure only. A preliminary rinse of 200 cc. of entozon solution was infused into the completely milked-out quarter. After massaging lightly, this was withdrawn and replaced by the principal amount, the volume of which was varied with the capacity of the quarter. It was found that no more than 800 cc. need be given, since such volume is as effective as larger amounts. The principal infusion was left in the lactating udder for from 45 minutes to three hours, and overnight in dry udders.

Eleven lactating and eleven dry cows, in one herd, having a total of 61 quarters shedding *S. agalactiae*, were treated with entozon. All quarters on each treated cow were infused, making a total of 88 receiving treatment. *S. agalactiae* disappeared from 55 quarters, or 90 per cent. Using the cow as a unit, 19 out of 22 cows treated were cured. This represents an efficiency of 86.3 per cent. To produce this result, 20 quarters required one infusion each; 19 quarters, two; ten quarters, three, and six quarters, four infusions, given at seven- to 14-day intervals. Six quarters, of the total of 88 infused, reacted unfavorably to the treatment, for two underwent partial atrophy, one became completely atrophied, and the teats of three others became occluded. This represents a damage of 6.8 per cent.

Entozon may prove to be useful in herds in which a mastitis-control program based on segregation is in force. Through treatment of the infected cows, the disease can be more quickly eradicated and the period of usefulness of the curable cases can thus be prolonged.

In helping dairymen to reduce the bacterial count of their milk, the first step is to locate the quarters that are shedding bacteria. To accomplish this, says Associate Editor Case, use the brom-thymol and microscopic tests combined.

Etiology of Abortions*

DEFINING abortion as expulsion of the production of conception before it is viable, the author points out that when the event occurs at the beginning of gestation it is not seen. In other instances the embryo is macerated or absorbed. These precocious abortions are generally considered as sterility.

Abortion Due to Lethal Genes.—Lethal genes can compromise life during the embryonic period. Numerous examples to that effect could be cited. Chicks of hens with short feet, die in the shell; mice with short tails, half hairless mice and yellow mice produce embryos that die during gestation; achondroplastic cattle of Africa, short-footed cattle of Dexler, Swiss cattle exported to Russia, mountain cows of Norway, *et al*, yield embryos that do not survive the prenatal period. Hybrid sows apparently normal have embryos that perish during the course of intra-uterine life. These examples should explain numerous abortions, anomalies and monstrosities of the fetus and its envelopes.

Mechanical Abortions.—These occur where there is an encroachment upon the capacity of the uterus from deformity, cicatricial contraction, or tumor. The fetus can not develop at ease and dies. Fetal monsters, sometimes twins, and dropsy of the envelopes may cause premature expulsion of the contents.

Reflex Irritability of the Uterus.—Violent injury, falls, surgical operations, alimentary toxicosis, exposure to cold, fever, hemorrhage, are so many agencies which may solicit premature contractions of the uterus and expulsion of its contents. Fever is abortifacient only when it strikes brutally. Slow, lasting fever seldom causes abortion. The number of abortions in pregnant animals suffering from anthrax, rinderpest and foot-and-mouth disease varies in different outbreaks.

*Free translation from Recueil de Médecine Vétérinaire, cxv (Nov. 1939). Delivered at the Journées Vétérinaires d'Alfort, June 9, 1939, by Professor Lesbouyries of the veterinary school of Alfort.

Nutritional Abortion.—Multiple abortions can occur from transient or definite deficiency of the sympathico-endocrine system, which prevents the female from following through with her state of gestation. The state of nutrition vitiated by old age, fatigue, overwork, and/or deficient alimentation are factors in abortion of this class. McCollum and Hart showed that abortion could be caused by feeding but one aliment, and Hardley demonstrated that feeding only wheat and barley was unfavorable to gestation. Phenomena of deficiency, often difficult to recognize in large animals, are often very striking in fowls, where they are expressed in low hatchability and livability of the chicks.

Vitamin A in the form of yeast, cod liver oil and greens is the usual remedy. Vitamin E deficiency can create a *locus minoris resistentiae* which permits *Brucella abortus* to persist and multiply.

Infectious Abortions.—The part played by *Mycobacterium tuberculosis* as interpreted by various authors (Plum, Ostertag, Bruyn, Bang, Thomsen) is described as an important factor in fetal deaths. Other microbic agents which have been incriminated are *Vibrio fetus* (Berge and Schoop), *B. pyogenes* (Wall, Klimmer, Thomsen), mycoses (Carpenter, Gilman and Birch), streptococci and Pasteurellae, and ultraviruses (Dimock and Edwards, U. S. A., and Sedelmeier and Hupbauer, Germany). These organisms cause endometritis (acute, subacute or chronic) which sooner or later hinders the embryo fixed to the uterus.

Contagious Abortions.—The term contagious abortion is improper. Abortion is not a disease. It is a symptom of an infection or contagious disease. That which distinguishes contagious abortions from multiple abortions is the fact that the former are *probable accidents* and the latter are but *possible incidents*. Contagious abortions, having two entirely different modes of transmission, should be divided into two groups: 1) In the one group, the abortion is the consequence of a venereal infection transmitted by copulation.

2) In the other group, the expulsion of the fetus occurs in the course of a general infectious disease that is spreading through the herd independent of sexual intercourse.

There are two specific venereal infections of the bovine species: *infectious granular vaginitis* and *trichomoniasis*. The former is due to the *Streptococcus* of Hecker and Ostertag and the latter to *Trichomonas fetus*.

Granular vaginitis was described for the first time by Isepont in 1887. Trichomoniasis is a more recent discovery. Although signalized by Mazzanti of Italy in 1900, it was not actually studied until 1925. Both of these diseases are transmitted by coitus, although in rare events they can be transmitted from one female to another by contact with fresh vulvar mucus on the litter. The two infections have a quasi-similar semiology. After a period of incubation of five or six days an inflammation is observed in the mucous membrane of the vagina or of the prepuce, as the case may be. In granular vaginitis, after this short period of incubation the mucous membrane tumefies and becomes coated with a mucopurulent exudate. The inflammation then declines and changes to a follicular, granular catarrh which is particularly marked in the region of the clitoris.

There is a lively controversy among veterinarians of different countries as to the rôle played by the *Streptococcus* of Hecker and Ostertag in causing abortions. While numerous authors agree that the disease frequently causes abortion and premature birth, others contend that this nodular catarrh is not followed by any complication in the pregnant cow and that if abortion occurs it is caused by *Br. abortus*. It is, however, true that abortions accompany granular vaginitis where brucellosis does not exist.

The pronounced analogies which exist, from the anatomo-pathological and epizootiological points of view, between granular vaginitis and trichomoniasis permit one to suspect an unknown relationship between the two organisms. If the abortifacient action of the *Streptococcus* of Hecker and Ostertag is doubtful, there is no dis-

pute about that action of *T. fetus*. Its rôle has been established in all countries.

Twenty-five years after Mazzanti discovered three cases of parasitism due to *T. uteru-vaginalis vitulae*, Hoppengartner (1925) found this flagellate in the stomach of a fetus. In 1928, Reidmeier recognized this organism as an agent of abortion and named it *T. fetus*. Later he changed the name to *T. bovis*. In 1932, Abelein of Germany showed that numerous abortions were not the work of *Br. abortus* or the *Streptococcus* of Hecker. He observed frequent precocious expulsions of the fetus and sometimes pyometra independent of Bang's disease and, moreover, found *Trichomonas* in the prepuce sac of bulls. By depositing the parasite upon the cervix before breeding to a healthy bull, Abelein was able, in several instances, to cause precocious expulsion of the fetus and subsequent sterility. Later, Witte produced abortion in rabbits and guinea pigs with bouillon cultures of the parasite, intravenously injected, and he completed the proofs by injecting these cultures into the vagina of three heifers affected with acute granular vaginitis followed by nodular catarrh. The bull to which these heifers were bred became contaminated and transmitted the infection (trichomoniasis) by coition to other cows. Finally, Reidmeier (1932) obtained positive reactions by complement fixation in two cows that had aborted from trichomoniasis. Trichomoniasis is, therefore, a venereal disease of both sexes with infection of the fetus.

The lesions of granular vaginitis often prevent conception. The cows come in heat but are sterile. Bulls presenting chronic catarrh may be fertile and normal. Two eventualities can occur in the female: 1) After a lapse of six to 16 weeks, rarely longer, a mucopurulent exudate appears on the lips of the vulva and abortion, which may escape notice, follows. Heat reappears in three or four days. 2) The fetus may die and not be expelled. The fetus and envelopes macerate, pyometra develops and distends the uterine horns and abdomen, leaving the impression that the cow is pregnant until an advanced period, whereupon a discharge containing yellow or

gray-green flakes resembling pea soup, indicates the presence of a pyometra which can be confirmed by the uniformly enlarged and fluctuating horns, and a large, persistent corpus luteum. In fact, precocious abortion and pyometra are characteristic of trichomoniasis. When this chain of events occurs in series in a herd, it is not even necessary to search for the parasite. That step may be justified for the first cases occurring in a herd if the character of the pus is not regarded as sufficiently significant.

As microbes kill the parasite, *T. fetus* can be detected only in fresh exudate. Pus specimens for examination should be transported to the laboratory at a temperature higher than that of the body. They can be carried in a deep pocket. To render the parasite more visible, Cameron recommends diluting the specimen in a solution containing blood serum, 5 per cent, sodium chloride, 75 per cent, and incubating for twelve hours. The organism is rendered more visible by staining with hematoxylin-eosin. The heat period is the favorable moment for taking the specimen.

T. fetus is fusiform, 10μ to 25μ long and 5μ to 10μ thick. The media may change its morphology toward roundness. It has three anterior flagella, sometimes of unequal length but generally as long as the body, and one posterior flagellum which is a prolongation of the marginal filament of the undulant membrane that trails behind like the body of a free flagellum. Its length is the same as that of the anterior flagella. The undulant membrane, located dorsally, courses along the body in four to six undulations. A basal filament starts from the blepharoblast and a thick axostyle departs from a club expansion traversing the body and terminating posteriorly in a pointed end.

Although the parasite has been found alive after a three-week sojourn in the urine of a cow, it is certain that it does not habitually live in exterior media. Its habitat is the living body and its mode of transmission is copulation. Determining first an endometritis and then placentitis, it rapidly kills the embryo. Its pathogenesis is such that the fetus never approaches the

end of gestation alive and never causes septicemia of the newborn. Hereditary transmission was never observed. Though cows may recover spontaneously, the bull carries the nodular catarrh, more or less discreet, indefinitely.

According to the author, the pathogenesis of abortion from trichomoniasis explains the abortions in cows infected with the *Streptococcus* of Hecker (granular vaginitis). The bacteria and the parasites are found associated in lesions of endometritis whether or not *T. fetus* acting alone provokes endometritis and precocious abortion. For a long time German and Swiss veterinarians have signalized the relationship of streptococcal granular vaginitis and expulsion of the fetus during the first weeks of gestation. This vaginitis, especially accused of causing sterility, provokes in reality unrecognized precocious abortions.

Nonvenereal Contagious Abortions.—These are the most important abortions. They occur not only in the course of acute infections, like the multiple abortions of acute general diseases, but in females affected with inapparent infections in which the mode of infection, may we say, is never copulation, and the latent character of which explains the repeated abortions in the same animal. To comprehend the gravity of these latent infections one must underline their essential characters.

Salmonella Abortions.—The *Salmonella* is an abortifacient *par excellence*. It is harbored by all species of animals, fowls and mammals. Pullorum disease is a good example. Here the germ can be followed in all stages of its pathogenicity. An adult hen that ingests solid or liquid food contaminated with *Salmonella pullorum* contracts paratyphosis sometimes in the form of fatal, acute, ulcero-membranous enteritis but more often in the form of a chronic, inapparent ovaritis. This genitotrophic microbe takes refuge in the ovary and shows its presence only at the hour of genital animation, when it infects the ova and remains fixed to them. It causes "abortion" in the sense that the embryo dies in the shell or the newborn suffer from diarrhea and either succumb or remain carriers through the microbe's taking ref-

uge in the genital organs, where at the age of laying, little diminished in vitality, it again infects the ova (eggs and embryos), completing the life cycle. The characteristic stages of this evolution of *Salmonella* in fowls is dramatized in all essential points in mammals; *Salmonella* of solipeds, large and small ruminants, carnivores, swine and rabbits arises from the same pathogenic mechanism. The disease appears in herds with an animal carrying *Salmonella* in its intestine, organs, and genital lymph nodes. According to the resistance of the individual, the disease manifests itself as an enteritis with particular ulcerative characteristics, or remains inapparent with latent ovarian infection where it may or may not cause sterility. When conception surmounts the infection, the animal aborts or gives birth to young affected with septicemia or polyarthritis. The starting point of the infection was the ovary in most instances but the abortion is of fetal origin. Repeated abortion in females affected with paratyphosis (*salmonellosis*) is generally due to latent ovarian infection rather than to chronic endometritis.

Colibacillary Abortions.—Coli and paracolibacillary abortions which have been reported in recent years by certain authors have been left suppressed. Our observations of several years in cows and mares show that the assertions of Lutje are well founded. He attributed many abortions to colibacillus infection. In 525 abortions in mares, Hupbauer found 254 so infected. The close bacteriological parentage of certain paracoli and microbes of the group paratyphoid B, the observations made in farms on sterility and abortions and the incidence of colibacillary septicemia of newborn permit one to suspect that the mode of transmission of certain colibacillooses is the same as for *salmonellosis*.

Brucella Abortions.—As in paratyphoid abortion, *Brucella* abortion occurs in the course of a latent *Brucella* infection and, like *salmonellosis*, it is observed in all species of animals. But while *salmonellosis* causes trouble in all species, *brucellosis*, except in rare instances in the sow and mare,

causes abortion only in ruminants. The research of Smith, of Doyle and of Hagan carried out with the object of finding the foci of predilection of *Brucella* by inoculating guinea pigs with material from a large variety of tissues showed in a preëmptry fashion that in the absence of gestations the organisms collected almost exclusively in the mammary glands, and in the lymph nodes and tributary lymph nodes of the uterus. In other words, *Brucella* organisms live and propagate in and around the great organs of reproduction: the mammary glands of heavy milkers and the uterus of great producers. Thus is explained the predisposition to *Brucella* infections of females abundantly nourished and well kept in order to bring regular gestations and sufficient milk. The relative absence of ovarian localization explains why *Brucella* organisms are less apt than the paratyphoid, colibacillary and paracolibacillary groups to affect the fetus and the newborn. *Brucellosis* is not an hereditary contagion. In fact, the best way to rehabilitate a herd decimated by *brucellosis* is to conserve the offspring.

PURPOSES OF THIS PAPER

The object is to recall the multiple causes of premature expulsion of the fetus and also the proper pathogenic mechanism of each of these factors, and to discuss the principal prophylactic measures. The numerous researches on *brucellosis* of man and animals have shown superabundantly the high incidence of the disease, but perhaps they have made us forget that other causes of abortions exist. More than ten years ago Gilman wrote: "The enthusiasm for the program of eradication of *brucellosis* has created the idea that there will soon be no more abortions." In a bacteriological study of 4,000 abortions, Jensen could attribute but one fifth of them to *Br. abortus*.

It is customary to base the diagnosis of *Brucella* abortion upon the presence of specific agglutinins in the blood serum or upon the cutaneous allergic test. Obviously, the observation confirms the presence of the *Brucella* organism. But, to conclude always that the abortions occurring in the

reactors are due to the brucellosis is certainly an error. The abortive action of the *Brucella* could not be determined by search for that organism in the body of the abort. Numerous examples may be cited of rural practitioners who were disappointed with anti-*Brucella* prophylaxis in reacting herds. It was their failures that brought about the researches which enable us to find *Salmonella* and more often *coli* and *paracoli* organisms present, and to try vaccinations against these germs.

The rôle of trichomoniasis, underestimated up to the present time, should take a place of importance in the etiology of abortions. Its clinical aspects and epizootiology have been overlooked in the diagnosis.

a) Precocious abortions connected with pyometra showing a liquid pus containing yellow flakes should be charged to *T. fetus*.

b) Abortions nearly always affecting the same cows with more and more delay in conception without septicemia of the newborn indicate brucellosis.

c) Late abortions associated with disease of the young point to an hereditary contagion or postnatal infection—digestive or umbilical—by microbes, of which the colon bacillus appears to be the most common.

No doubt these observations are not easy to make except when one is called late to farms where the prophylaxis used is found to be impractical. The idea is to immediately make an exact diagnosis. There is no other way to prevent the spread of the infectious material of the fetus, particularly the contents of its stomach. For this purpose the laboratory is indispensable. Attention is invited to comprehensive errors we all commit in leaving ourselves open to the legitimate criticism of the medical world.

In 1936, Professor Lisbonne related the following case. In collaboration with Dr. Merilac, he isolated a typical specimen of *Br. abortus* from the blood of a woman who was taking care of a cow that several months previously had received a living culture abortion vaccine. In the milk of the cow he detected the same atypical germ that he found in the vaccine used. He estimates that all living vaccines are danger-

ous for man and he cites the example of a veterinarian in eastern France who contracted undulant fever from an accidental inoculation of this vaccine. These grave accidents, says this Montpellier professor, are due to the fact that because killed vaccines are not effective, preventive immunization or premunization with living cultures is used to produce a slight infection that will protect the animal against an aggressive infection. It is evident, on the one hand, that the living vaccine would be useful only if the abortions are from brucellosis diagnosed by discovery of the organism in the aborted fetus. On the other hand, the "virus-vaccine" should be one of known virulence established by proper supervision. It is not our view that such a vaccine should never be used, for logically the best way to protect against an infectious disease is to create a minimum infection not dangerous to health. In the case of chronic infection, a light and protective focus of infection is created (premunition) to meet that necessity. We do not believe, however, that living *Brucella* organisms provoke premunization, for the reason that the given animal has a natural tendency to recover from the infection. According to an old saying, nature avoids breaking the eggs and, moreover, living vaccine accelerates the rhythm of abortions and does not prevent them. Yet, live culture vaccination with a vaccine of known attenuation, always controlled, is the only available prophylaxis outside of the pure and simple isolating of the herd, and reconstructing it from its own progeny, never introducing new animals from without.

The general notions on the etiology lead to the following conclusions:

Brucellosis is not as often the cause of epizootic abortion as the agglutination reactions indicate. *Trichomonas*, *Salmonella*, and *colibacillus* play a prominent rôle in abortions in series. The only exact diagnosis is to find the causative agent. That must be the starting point of logical and useful prophylaxis. Specialized laboratories are required. Though these institutes are too few at the present time (in France) to respond promptly to the daily demands of

the practitioners, it is reasonable to claim that our profession sustains breeding and aids owners of animals in the choice of breeding animals of all species and breeds. This is important work but the daily need is to give breeders the means of having more fruitful copulations and better means of preserving the products thereof from the very moment of conception to the hazardous hour of weaning.

Laboratories Needed.—The veterinarian will remain in the realm of empiricism as long as he does not have at his disposition in his region laboratories that work toward therapeutics and prophylaxis based upon the etiology of the troubles he encounters. For a long while we have hoped that such regional laboratories would be established. To obtain these foci of research and help, which exist by the dozens in certain countries, their need must first be comprehended. They are necessary for integral success.

Antitetanic Vaccination in the U. S. Navy

Tetanus is one of the most serious problems of wartime medical science. An open wound may pick up the germ from soil, manure or ordinary highway dust.

Commander W. W. Hall, U. S. Navy surgeon, recently announced that a toxoid for vaccination against the disease has proved so successful that after injections of two doses eight weeks apart, the individual becomes a walking antitoxin factory. He says further that the entire Naval Academy personnel has been vaccinated against this disease, and if wounded will never again need to be injected with horse serum or face the danger of serum reaction.—*Scientific American*.

Current information indicates that all of the horses of the French army also are permanently protected against tetanus by toxoid vaccination. In fact, it was through the use of these thousands of "guinea pigs" by Ramon of the Pasteur Institute that the true merits of antitetanic vaccination were proved.

Minerals in Milk

In general the ash, calcium and phosphorus in cow's milk decreases during the first month of lactation, remains fairly constant until the last three months of lactation and then increases steadily until the end of the milking period. Phosphorus did not increase as much as calcium during the latter period. It was also noted that the mineral content was lowest during the summer months, particularly in July. [*South Dakota Agr. Exp. Sta. Bulletin No. 331.*]

Brucellosis in Swine

Swine brucellosis, porcine infectious abortion or Traum's disease, is the subject of a multigram issued to veterinarians by the Division of Animal Pathology and Hygiene, University of Illinois. Identified as Project 1046 (Swine), the document draws attention to the presence of the disease in many Illinois localities and to the main facts appertaining to its control.

The disease, says the circular, is introduced into healthy herds through the purchase of apparently healthy gilts, sows or boars and, inasmuch as there is no biological preventive or cure, blood testing to detect the infected and eliminating them is the important step to take in ridding a farm of the trouble. The reactors may be sold for immediate slaughter, sold as reactors to be introduced into other infected herds, or they may be maintained under supervised isolation. Aborters should not be returned to the farm being cleaned up until proved to be negative to the agglutination test.

Breeding animals should be tested annually and only animals from accredited herds should be purchased. All others are kept in quarantine for two months after the last negative test. Certificates of accreditation are issued by the Department of Agriculture on the basis of two semi-annual negative tests.

According to reports heard at society meetings in the Corn Belt states, testing and eliminating the reactors solves the porcine infectious abortion problem and it is being used widely among breeders of purebred swine.

Some Diseases of the Eye of Animals. I. Anatomy and Physiology*

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THE EYE is by no means of least importance among the organs of special sense and, therefore, should receive the careful attention of the veterinarian. This is particularly true in equine practice. Any discussion of so complex an organ as the eye and its diseases necessarily entails considerable space, but when a consideration of the accessory structures and their diseases is added, there is danger of becoming too involved and tedious. For the sake of succinctness, clarity and interest, therefore, this discussion will be divided into three parts. The first will include a rather brief description of the eye and its accessory structures from the standpoint of anatomy and physiology. References to the relationship of anatomy to pathology, when such exists, also will be considered. The second part will deal with the more common diseases of the eyes of animals, excluding periodic ophthalmia of horses, which will be the subject covered in the third and last part of this project.

The orbit is a hollow cavity, completely bony in man, and incompletely so in domestic animals. Through the orbital sheath, attaching at the optic foramen posteriorly, and completely surrounding the bony orbital rim anteriorly, the orbit is transformed into a conical cavity. It contains the eyeball, fascia, fat, ocular muscles, nerves, vessels and the lacrymal gland. Superficial and deep fascia within the orbit separate, surround and bind the various orbital structures together. The orbital fat acts as a pad or cushion on which certain structures rest, and it also serves to separate others.

The ocular muscles are seven in number: four recti or straight muscles (superior, inferior, lateral and medial), two

oblique muscles (inferior and superior) and the retractor oculi or choanoid muscle. The motor center for the ocular muscles is bilateral, and the muscles are stimulated in groups. Unilateral stimulation results in lateral gaze, while bilateral stimulation is necessary for upward or downward gaze.

The common oculomotor (third) nerve innervates all but the lateral rectus, which receives its stimuli from the abducent (sixth) nerve, and the superior oblique, which is innervated by the trochlear (fourth) nerve. The ciliary ganglion, which lies along the inferior branch of the oculo-motor nerve, sends out the ciliary nerves, and branches to the sphincter of the pupil. A sympathetic filament supplies the dilator mechanism of the pupil.

The vascular supply to the eye of the horse is derived mainly from the external ophthalmic artery, which is a branch of the internal maxillary artery. It is to be noted that the latter arises from the external carotid artery. In man the ophthalmic artery is a branch of the internal carotid. The internal or small ophthalmic artery is a terminal branch of the internal carotid. It is of little importance, however, compared with the main ophthalmic artery. In other domestic species the external ophthalmic artery is a branch of the internal carotid, and the vascular supply to the eye is essentially the same as in the horse.

The lacrymal gland and its accessory structures are responsible for the proper lubrication of the exposed surface of the globe, as well as the drainage of tears from the eye. The gland is situated dorso-laterally to the bulb and possesses a varying number of ducts (in different species) which open in the region of the fornix. The gland receives a tri-fold nerve supply and is nourished by a branch of the ophthalmic artery. The drainage apparatus consists of

*The first of three articles on the subject.

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two puncta, or slit-like openings, situated a few millimeters from the inner canthus, on the mucous margins of the upper and lower lids. These are connected by arched canals to the lacrymal sac, which is merely the dilated upper end of the lacrymo-nasal duct.

The eyelids are two freely movable cutaneous folds, the upper more mobile than the lower. They perform the dual function of spreading the lacrymal fluid over the exposed surfaces of the eye, and of protecting the eye against the entrance of foreign and irritant substances. When the eye is open, and the lids present no lesions, the upper lid margin is seen to extend a few millimeters over the upper limbus, while the lower margin is just about in apposition with the limbus. The outer surface of the lids is covered with fine skin, and they are lined on the inner surface by the conjunctival mucous membrane. At the outer lid margins are the cilia, or eyelashes, while at the free inner margin numerous small openings can be seen which are the outlets of the ducts of the tarsal or Meibomian glands. In addition to the two main lids, domestic animals possess a more or less well-developed third eyelid, or membrana nictitans, located in the inner canthus. In the horse it is represented by a thick cartilaginous base, deeply situated in the orbit in a pad of fat, and a curved, thin, cartilaginous part covered by a fold of conjunctiva. On its inner surface is the gland of Harder. It is important to note that the lids receive their blood supply from branches of the ophthalmic artery. They are innervated by the third and seventh cranial nerves, together with sympathetic stimuli.

THE BULBOUS OCULI, OR EYEBALL

The eyeball is a hollow, more or less egg-shaped organ made up of three concentric tunics. They are: an outer fibrous, a middle vascular and an inner nervous coat. Within these are the refractive media, the aqueous humor, the lens and the vitreous humor, the function of which is to refract or bend the rays of light falling on the cornea (eye) so that they will focus upon the retina. The vascular supply to the eye is

by way of the ophthalmic artery, which has been mentioned, and its nerve supply is received from the ophthalmic ganglion and sympathetic fibers.

The outer fibrous coat of the eye is made up of the sclera, which is a dense, translucent tissue constituting the posterior five sixths of this tunic, and the cornea, a transparent avascular part comprising the anterior one sixth. The sclera gives support to the other structures and protects the eye by its denseness, while the cornea transmits light rays to the inner globe and acts in a refractive capacity in the dioptric system of the eye. The cornea is composed of five distinct layers, one of which, Decemet's membrane, is very resistant to the action of heat, bacteria and their toxins, and even chemicals. This resistance is of great importance in preventing perforation of the cornea.

The middle vascular coat, or uvea, is divided into three parts, all intimately connected with one another. From anterior to posterior, they are:

- a) The iris, or curtain of the eye, which is pierced by an opening, the pupil.
- b) The ciliary body (middle part), which gives support to the suspensory ligament of the lens, and contains the ciliary muscle, which is responsible for visual adaptability.
- c) The choroid, which is the most posterior part of the uvea.

The uvea, or vascular coat, usually is considered as being divided into two segments: 1) an anterior, made up of the iris and ciliary body, and 2) a posterior division, represented by the choroid. The vascular supply is partly responsible for this division, since each part has its own circulatory system. The posterior segment is supplied by the short posterior ciliary arteries, four to six in number, and the anterior segment by the two long posterior ciliary arteries, as well as the anterior ciliary arteries. The long posteriors course through the choroid without collateral branching, pass into the ciliary body, where collaterals are given off, divide upon entering the iris, and then unite to form the major circle of the iris. From this

twigs are given off which pass forward, divide, and reunite in the formation of the minor arterial circle of the iris. The anterior ciliary arteries, through anastomoses with the major arterial circle which, in turn, anastomose with the posterior conjunctival vessels, result in a vascular "hook-up" between the conjunctiva and the anterior segment. This explains, therefore, the possibility of hyperemia of the anterior segment, resulting in conjunctival engorgement, and *vice versa*.

The choroid, or posterior segment, is made up of five layers, one of which is the tapetum. This layer is fibrous in some animals and cellular in others. In either case it is highly pigmented and, therefore, represents the part which forms the beautifully colored eye ground, as seen with the ophthalmoscope. These colors, in the horse, range from blue through various shades of green into yellow. Combinations of these, interspersed with streaks of red, deep blue or purple may be seen, together with stippling. Dogs and cats often possess a multi-colored eye ground, the former often showing a beautiful opalescent picture in the inferior zone. In any case, the tapetum is lustrous in the superior part, and it is this factor which is responsible for the luminosity of the eyes of domestic animals. The pig, however, does not possess this luminous layer of the tapetum, and the eye ground is of a dull reddish-brown color.

The inner nervous coat of the eye, the retina, is a thin membrane made up of ten layers, and during life it is transparent. It represents in part an expansion of the optic nerve, the fibers of which lose their medullary sheath after leaving the optic disc (papilla or nerve head). This structure is the point of entrance of the optic nerve into the globe. The disc sometimes is known as the "blind spot," because the nerve fibers still have the medullary sheath at this point and, therefore, can not "pick up" light stimuli. The disc appears in the lower hemisphere of the globe, as a rule, and it varies in size, shape and color in the different species. Light rays falling upon the retina are not passed immediately from the superficial to the deep layers, but are received by the deeply situated rods and

cones, passed to the more superficially located visual cells in the nuclear layers, and then by way of the nerve fibers to the optic nerve, which carries them to the brain. In domestic animals, except the horse and other Equidae, the retina possesses a complete circulation of its own, which supplies it with its own nutrition. The veins are broad and flattened, and of a dark red color. The arteries, on the other hand, are a much brighter red, exhibit a more or less well-defined light streak, and twine around the veins. These vessels, which emerge from the disc, are terminal branches and capillaries, so that with the ophthalmoscope, and under the magnification of the lens and vitreous humor, one actually can see microscopic pathology, when such exists. Vascular pathology in the eye is usually an indication that the same condition exists elsewhere in the body.

The retinal circulation in the horse is meager, being represented by very small, thread-like vessels which emerge, as a rule, from the periphery of the disc. They extend out about a disc's diameter superiorly and laterally, but are less evident and smaller inferiorly. The veins and arteries are indistinguishable, and often show interruptions in their continuity, as well as twistings along their course in some instances. For this reason, the retina in the horse has to depend almost entirely upon the subjacent choroid for its nutrition. This dependence of the retina upon the choroid makes it almost impossible to have pathology in the latter without some expression of the condition in the retina.

THE REFRACTIVE MEDIA

While the cornea plays an important part as a diopter in the optical system of the eye, it is not considered a part of the refractive media. These media, as has been mentioned, are the aqueous and vitreous humors, and the crystalline lens. They are all avascular and, therefore, can not, of themselves, enter into inflammatory processes. They do, however, show pathological changes, the expression of inflammatory and other pathological changes in the tissues immediately surrounding them. The aqueous humor, as its name implies, is a

water-like substance which normally is crystal clear. It is a modified plasma, quite closely related to the cerebrospinal fluid, but its albumin content is very low. It fills the anterior and posterior chambers, and is being produced and drained off constantly through a well-developed drainage system.

To clear up a point which often is very confusing, it seems advisable to point out the location of the anterior and posterior chambers. The former is the space between the iris and the cornea, while the latter is the space between the iris and the lens, and not the space occupied by the vitreous body.

The crystalline lens is a transparent, bi-convex body located between the aqueous and vitreous humors. It is firm but elastic, and is made up of concentric layers of elongated, modified epithelium, arranged much the same as the layers of an onion. Nuclei appear only at the periphery, and they are responsible for the formation of new cells or fibers, as the old ones become packed at the center. The lens is surrounded by an acellular, transparent envelope, usually referred to as the anterior and posterior capsules.

The vitreous humor is a soft, transparent, jelly-like mass occupying the space between the crystalline lens and the retina. Anteriorly it possesses a small depression or fossa, which just accommodates the lens. The vitreous itself is composed of a delicate reticulum, a few embryonic-type cells and a large amount of an amorphous substance. The reticulum becomes condensed at the periphery to form a supporting membrane, the hyaloid capsule. A thin canal traverses the center of the vitreous from the posterior pole of the lens to the optic disc. It is normally invisible during life. In fetal life, however, this canal houses the central hyaloid artery, which is an extension of the central retinal artery to the developing lens, which it supplies with blood. In some animals, notably the bovine species, a prominent vestige of this artery remains in adult life. (It is more prominent in calves, however.) It appears as a delicate, worm-like projection extending out into the vit-

reous from the optic disc, and waves about with undulations of the vitreous, caused by the movements of the animal's eyes.

The Gene and the Virus

Studies of the gene and the virus bring us face to face with the origin of life. Those, like Osbourne, who believe that life generated spontaneously on this earth, look upon genes and viruses as road makers in the realm of organic evolution. The idea that microbic life is universal and is preserved in the cold of space and carried by radiant energy (Arrhenium) from one spot to another favorable for life also postulates an origin of life on earth as cells of microscopically visible size already formed.

To say offhand that the gene of the geneticist and the virus of the pathologist are closely related is startling but true, according to recent concepts of these two invisible entities. The fact that the gene is the blessing that gives character to the new being and the virus tends to destroy it seems fantastic. Yet these two entities have been working hand in hand all the time in the process which led to biological existence and development. The earliest form of life on earth is now believed by some scientists to have been associated with virus-like protein molecules which appropriate plasma necessary for growth (Castle, 1940). On the other hand, a concept of the nature of viruses (Green, 1935) now receiving favorable acceptance (Laidlaw, 1939-1940) is that viruses did not originate by synthesis as a part of cellular evolution but represent parasitic microbes which have degenerated much the same as the tapeworm lost its intestinal tract while living in host animals.

Watching the scientific facts coming to light at this hour on the gene and the virus seems to be a preview of far-reaching discoveries on the beginning of life.

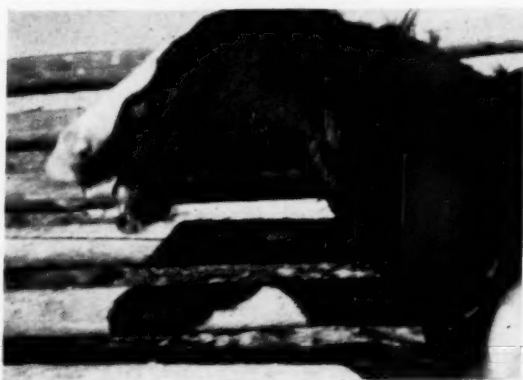
Dams immunized against tetanus with tetanus toxoid, transmit the state of immunity to their offspring.

Reactions in Horses Following Inoculation of Chick-Embryo Vaccine*

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THE CORRECT evaluation of the causative factor or factors involved in the development of untoward reactions following the injection of chick-embryo vaccine employed in the prevention and control of equine encephalomyelitis in horses presents an urgent problem to the clinician and labora-



—After Cox, Philip, Marsh and Kilpatrick, 1938.
Encephalomyelitis, snarling symptom often seen in connection with the second epizootic.

tory investigator. On the basis of our present knowledge, earnest consideration should be given to the possibility of some substance or substances in the vaccine to which certain horses are hypersensitive. The difficulty experienced in reproducing the untoward reactions experimentally and the large number of horses successfully vaccinated make it apparent that the potential anaphylactic-like factor involved may be detected only after extensive investigation. However, it should not be concluded at this time that some horses do not become sensitized to certain chick proteins or substances in the vaccine even though double doses of the vaccine have been experimentally administered subcutaneously, intramuscularly, and intravenously to a few horses without inducing noticeable

symptoms. Nor does it seem safe to conclude that only old vaccines are capable of inducing untoward reactions, since unfavorable reactions from fresh vaccine have occasionally been reported. The difficulty involved in the solution of this problem is recognized in the negative attempt to reproduce reactions as observed in the field with vaccines of the same serial number when experimentally injected into young and old horses.

Quite apart from the possible part played by hypersensitiveness of some horses to the vaccine, the possibility of sepsis incident to inoculation of vaccine can not be entirely disregarded. A bacteriological examination of selected tissues from the seat of inoculation from three fatal cases in our



—After Cox, Philip, Marsh and Kilpatrick, 1938.
Encephalomyelitis, cross-legged symptoms.

experience yielded *Clostridium oedematis-maligni*.

In so far as the findings in three fatal cases coming to our attention have a bearing on the problem, practitioners are urged to use aseptic methods in inoculating vaccine. Clipping the hair, shaving the skin and a double application of alcohol, tincture of iodine, or some other equally suitable antiseptic solution at the point of injection seems highly desirable. In connection

*From the Division of Animal Pathology and Hygiene, University of Illinois.

with the possibility of infection it should be made clear that vaccines examined for contaminating organisms have repeatedly proved negative and that the source of infection in the fatal cases mentioned may obviously be associated with contamination of the skin. However, a contaminated needle used in inoculation might also serve to carry bacterial infection from animal to animal. A separate sterile needle, therefore, should be used for each animal. Although it is not inferred that all reactions are due to infection, the practice of

inoculating vaccine with aseptic precautions is a professional responsibility. Furthermore, the veterinarian has the responsibility of acquainting every owner with the potential danger of even minor operations and, while the untoward reactions in horses to encephalomyelitis vaccine are relatively few in number, it seems that educational programs should point out the possibility of untoward reactions to prepare the owner for any irregularity that inadvertently follows, even though the percentage of irregularities is small.

Reactions Following Administration of Equine Encephalomyelitis Vaccine*

By H. W. SCHOENING, V.M.D.

Washington, D. C.

IN THE EARLY PART of May, attention of the bureau of animal industry was called to some severe reactions and losses in horses following the second injection of equine encephalomyelitis vaccine. Since only a comparatively small number of animals had been treated at that time, these reports were of a disturbing nature. Since most of the vaccine available for early treatments was prepared last year, there appeared to be a possibility that through the aging of the vaccine there might have developed certain substances highly antigenic (but not necessarily related to the specific virus) so that when some animals which were particularly sensitive to foreign protein were injected with the second dose of the same product, severe reactions and death might occur. These vaccines have passed rigorous laboratory tests and have been demonstrated before release to the trade to be highly potent and otherwise satisfactory, short of their actual use on horses in the field.

While many animals have already been vaccinated with two doses of this vaccine without any reactions, some serious reactions and deaths have occurred. That the individual animal plays a part in these reactions is quite apparent, since many ani-

mals receiving the same vaccine failed to show any reactions. Laboratory tests of lots of vaccines reported to have caused reactions in horses have failed in every instance to show any contamination of the vaccine. The exact cause or causes of these unfavorable reactions in horses following



—After Cox, Philip, Marsh and Kilpatrick, 1938.

Encephalomyelitis, sleepy type, showing animal just prior to falling.

the injection of chick-embryo encephalomyelitis vaccine are not yet definitely known, but it appears probable that there is a relationship between the reaction and the age of the vaccine (and/or its handling) and the individual horse. Present observations indicate that apparently more

*From the Pathological Division, Bureau of Animal Industry, U. S. Department of Agriculture.

reactions have occurred in animals that have been previously vaccinated. Attention was called by the writer in the September 1939 issue of the JOURNAL to reactions following vaccination. Among other things the importance of a good technic of administration of the vaccine was stressed and also the fact that the injections should be given in widely separated places. It is desired again to emphasize these points. Aside from this, however, it is believed that the individual animal in its reaction to a foreign protein also may play a great part in reactions that occur. It is also possible in such types of individuals that organisms which may be introduced through the act of vaccination and which ordinarily would not result in any trouble might, when deposited in tissues that are undergoing a reaction process, become highly active. It is again desired to emphasize the fact that vaccines should at all times prior to injection be kept refrigerated at a temperature of about 40° F.

In view of the fact that certain animals may react, particularly to the second injection of equine encephalomyelitis vaccine, it is suggested that all animals be observed after the first injection, and reactions, if any, noted. If animals show excessive swelling or are otherwise inconvenienced by the first injection, it might be well to omit the second injection in such animals. There is laboratory evidence to show that a considerable immunity is engendered even with one injection of vaccine. A number of reports received this year indicate that some animals, following the second injection of vaccine, show a typical anaphylaxis, evidenced within a few hours following the administration of the second injection. More of these have been reported than in previous years. It is advisable to be prepared to give appropriate treatment to animals that might show typical anaphylaxis—2 cc. of 1:1,000 epinephrine subcutaneously, in extreme cases intravenously.

In the July 1940 issue of *Veterinary Medicine* there appears an article on intradermic vaccination against equine encephalomyelitis. That article is abstracted by the author in the next column.

The Intradermic Method of Vaccination Against Equine Encephalomyelitis

Following occasional reports of reactions in horses vaccinated in 1939 with two doses of equine encephalomyelitis chick-embryo vaccine, a study was made of the intradermic vaccination technic, employing commercially prepared chick-embryo vaccines, in order to determine whether or not a practical immunity could be induced in horses by intradermic vaccination and whether or not disturbing reactions could be eliminated or reduced.

Tests in guinea pigs showed the intradermic injection of vaccine to be at least as effective as the subcutaneous injection. In horses the intradermic injection of vaccine showed a higher degree of protection than the same amounts injected sub-



—After Cox, Philip, Marsh and Kilpatrick, 1938.

Encephalomyelitis, showing dirt-eating symptoms.

cutaneously, and in one experiment two 1-cc. doses intradermically were as effective as two 10-cc. doses subcutaneously.

Vaccines which were reported to have caused severe reactions in horses in the spring of 1940, when injected into 20 horses intradermically produced very little reaction. The same vaccine injected subcutaneously or intramuscularly into 20 horses produced in some of the animals rather marked, extensive swelling. A greater number of these untoward reactions appeared in horses which had been vaccinated in 1939. [*H. W. Schoening et al. Studies on the Intradermic Method of Vaccination Against Equine Encephalomyelitis. Veterinary Medicine, xxxv, July 1940.*]

Results of Feeding Zinc to Pregnant Mares and to Mares Nursing Foals*

By ROBERT GRAHAM, B.S., D.V.M., JESSE SAMPSON, B.S., D.V.M., Ph.D., and H. R. HESTER, D.V.M., M.S.

Urbana, Ill.

IN NOVEMBER 1937, the University of Illinois was asked to identify a disease in two suckling colts on a farm located near Depue, Ill. W. L. Farley, veterinarian at Peru, Ill., was of the opinion that a zinc smelter, located in the vicinity of the farm, was in some way responsible for the malady affecting the foals. Dr. Farley assumed that the pasture in which these colts and their dams grazed contained toxic amounts of zinc. It was believed that the zinc was being deposited on the grass from fumes of the zinc smelter plant and that the mares, feeding upon the zinc-contaminated grass, excreted zinc *via* the milk in amounts sufficient to poison the colts. This conjecture implied the poisonous character of zinc to colts, though cattle and other animals were presumed to be tolerant, since these species were not affected.

Following an inspection of the colts in the pasture by a representative of the laboratory of animal pathology and hygiene, University of Illinois, the nature of the disease was not recognized. To facilitate a diagnosis arrangements were made to deliver the sick colts to the University of Illinois for treatment and diagnosis. The colts failed to respond to treatment. In order to determine the nature of the disease, the moribund colts were humanely destroyed for examination. The autopsy findings (laboratory specimens 6681-82) were summarized and reported under date of November 12, 1937, as follows:

- 1) Parasitism, including strongyles, bots, and large roundworms.
- 2) Possibility of borderline aphosphorosis.
- 3) Arthritis.

*From the Division of Animal Pathology and Hygiene, University of Illinois. This project was conducted with the assistance of L. E. Boley, N. D. Levine and J. A. Henderson of the Division of Animal Pathology and Hygiene; J. L. Lindgren, Department of Chemistry; and H. H. Mitchell and John Longwell, Department of Animal Husbandry.

4) Bacteriological examination: Negative.

5) Chemical tests were negative for arsenic and lead, but abnormal amounts of zinc were found in the bones, liver and urine of the colts, as well as in the mother's milk.

Comment: In preventing further losses, three lines of endeavor are suggested:

1) All horses on the farm should be thoroughly treated for parasitism, including bots, large roundworms, and strongyles.

2) The mares should be fed an approved and complete ration.

3) An effort should be made to determine the effect, if any, of zinc on pregnant mares.

Since the preliminary findings were somewhat suggestive that zinc might have



Fig. 1. Unthrifty colt 6681, photographed 11-12-37.

been a factor in the illness of the two colts (specimens 6681-82) an experimental inquiry into the effect of zinc on pregnant mares and mares nursing colts was undertaken. This study was inaugurated in June 1937 and completed December 1, 1939. The purpose of this paper is to report the results of feeding zinc to pregnant mares and to mares nursing foals.

LITERATURE ON ZINC-FEEDING EXPERIMENTS

The effect of zinc administration upon reproduction and growth in the albino rat has

been studied by Thompson, Marsh and Drinker.¹ These investigators concluded:

The feeding of organic zinc salts or of zinc oxide in doses of from 2 to 388 mg. of zinc daily to albino rats, not only for many



Fig. 2. Colt 6681, showing erosion of the articular cartilages of the upper external humerus and lower extremity of the scapula.

weeks previous to mating, but during pregnancy and lactation as well, has no significant effect upon the health of the parent, upon fertility, nor upon the health and the early growth of the offspring. The offspring of zinc-fed parents, weaned at twenty-three days of age and themselves put upon daily doses of zinc, grow at a normal rate and to a normal adult size. The experiment has not thrown any light upon the cause of the high zinc concentration often found in reproductive organs, nor upon the possible rôle zinc may play in the phenomenon of reproduction.

Suggestive evidence of zinc poisoning has been reported by Grimmer, McIntosh, Wall and Hopkirk² (New Zealand). These investigators fed three weanling pigs 0.1 per cent zinc as zinc lactate with milk and a small amount of meal for two months. The pigs developed a stiffness and a form

of arthritis which these investigators believed might be attributed to a disturbed mineral metabolism resulting from zinc feeding. Further studies, in which a larger group of pigs is used and careful attention given to all other factors that might be causes contributing to the stiffness and lameness, would appear to be necessary to confirm the significance of the observations reported by the New Zealand investigators.

EXPERIMENTAL PROCEDURE

The investigation at the University of Illinois, designed to supply the desired information on the effect of feeding zinc to pregnant mares and to mares nursing foals, was initiated in June 1937, and concluded on December 1, 1939. All mares were placed under observation for a period of three to four weeks and treated for internal parasites before entering the experiment. During the preexperimental zinc-feeding observation, samples of blood, urine and milk were collected from the mares for laboratory study, *viz.*, zinc analyses of urine and milk, while blood examinations included determinations for serum calcium and serum inorganic phosphorus, as well as red and white blood-cell counts. Appropriate blood and urine samples also were collected from the colts before the mares were fed zinc. During the course of the experiment, feces were collected and analyzed for zinc. The chemical analyses and other laboratory studies also were repeated at intervals throughout the trial of the zinc feeding. (See table I.)

Amounts of Zinc Fed Daily.—Three and one-half Gm. (54 gr.) of zinc lactate was fed daily in the basal ration of grain, supplemented by hay and pasture, to each of four mares (79, 89, 8 and 131). This amount of zinc lactate contained approximately 0.8 Gm. (12 gr.) of zinc, an amount that was believed to represent the maximum consumed daily by each of the mares while suckling the affected foals in November 1937. The value of 0.8 Gm. was selected on the basis of the zinc analysis of the grass in the pasture and of the grass in pastures adjacent to the zinc

¹Thompson, P. K., Marsh, M., and Drinker, K. R.: *Amer. Jour. Physiol.*, lxxx (1927), 1, pp. 65-74.

²Grimmer, R. E. R., McIntosh, I. G., Wall, E. M., and Hopkirk, C. S. M.: *New Zealand Jour. Agr.*, liv (1937), 4, pp. 216-223.

plant, which revealed a maximum content of 60 parts of zinc to 1 million parts of grass. The dosage was further calculated by assuming that a mature horse would consume about 30 lb. of grass in a 24-hour day. Two other mares were each fed daily ten times this amount of zinc, or 35 Gm. (540 gr.) of zinc lactate daily plus the basal ration of grain, hay and pasture. It was believed that a liberal daily intake of zinc would serve to intensify or accentuate symptoms that might develop in the mares (or their foals) being fed 3.5 Gm. (54 gr.) of zinc lactate daily.

The colts were left with the mares at all times until they were weaned. Attention is called to this point for the reason that this practice allowed the colts an opportunity to obtain a certain amount of zinc lactate directly from the feed that was given to the mares during the nursing period. It is not likely that the amount of zinc consumed in this manner was very large, yet there remains the possibility that a significant quantity may have been eaten by some of the foals after they had developed an appetite for grain.

SOURCE OF ZINC LACTATE

The zinc lactate used in the experiment was produced under the supervision of C. S. Marvel, professor of organic chemistry at the University of Illinois. Check analyses were made on representative samples by chemists of the University of Illinois.

CHEMICAL ANALYSES AND BLOOD DETERMINATIONS

The chemical analyses for zinc in milk, urine and feces collected from the mares and colts were made by the applied chemistry laboratory of the University. All zinc analyses not made by the applied chemistry laboratory were conducted by the laboratory of animal nutrition. The analyses of the blood of mares and foals for serum calcium and serum inorganic phosphorus, the examination of urine for pathological constituents, the determination of red and white blood-cell counts, the clinical observations and the autopsies on the colts that died were conducted by the laboratory of

animal pathology and hygiene, University of Illinois.

EXPERIMENTAL PREGNANT MARES AND MARES NURSING FOALS

Control mares 1 and 2 and their nursing foals were fed the daily basal ration of corn, oats, hay and pasture. These pure-bred Percheron mares and their foals from the University of Illinois Percheron stud served as controls on the basal ration fed to all mares and foals in the experiment and no zinc lactate was added to the ration of these animals. No symptoms of unthriftiness or illness were observed in the control mares or foals during the course of the investigation.

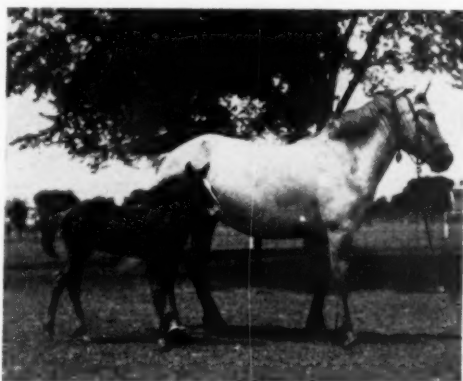


Fig. 3. Mare 57 and foal (1938), photographed 7-25-38. Foal born 7-6-38; weaned 10-18-38. Mare bred 7-15-38; foaled 6-4-39.

Mare 79 was the dam of the male colt (laboratory specimen 6682), one of the two foals that were clinically affected in 1937. Her 1938 foal was born June 7, and the mare and her foal were delivered to the University on June 22, 1938. This mare received the basal ration of grain, hay and pasture, plus 3.5 Gm. (54 gr.) of zinc lactate daily from June 23, 1938, to September 1, 1939, or approximately 3 lb. of the lactate in about 430 days. Mare 79 was bred August 12, 1938, but did not become pregnant. No symptoms of unthriftiness or illness developed either in the mare or in her 1938 foal.

Mare 89 was the dam of the sick mare colt (laboratory specimen 6681) that was examined in 1937. Mare 89 did not foal

TABLE I—Summary of data on zinc-feeding experiments with mares and colts.*

ANIMAL	ZINC IN MILK (MG. PER KG.)		ZINC IN URINE (MG. PER KG.)		ZINC IN FECES (MG. PER KG.)	
	BEFORE	DURING FEEDING	BEFORE	DURING FEEDING	BEFORE	DURING FEEDING
7 (mare)	2.00		0.40	5.60		272.00
8 (mare)	5.00		1.00	5.00		61.13
8C (colt of 8)				0.30		59.56
57 (mare)	3.00	4.27	0.20	6.95		235.57
57C ₁ (1938 colt of 57)				0.50		142.35
57C ₂ (1939 colt of 57)				1.10		
79 (mare)	5.00	4.00	1.00			38.28
79C (colt of 79)			0.40	0.50		94.37
89 (mare)		2.81	0.30	5.20		66.83
89C ₂ (1939 colt of 89)						119.00
131 (mare)			0.40	3.20		27.87
1 (control mare)	5.00		1.00		3.33	
1C (control colt)					33.20	
2 (control mare)	5.00		1.00		3.30	
2C (control colt)			0.50		66.40	

*The values in this table pertaining to the determinations made during feeding are in some instances the average of several determinations.

in 1938. This mare received the basal ration of grain, hay and pasture plus 3.5 Gm. of zinc lactate daily from August 1, 1938, to September 1, 1939, or approximately 2.8 lb. of the lactate in about 390 days. She was bred July 13, 1938, and foaled June 1, 1939. Zinc lactate was fed at the rate of 3.5 Gm. per day during the period of pregnancy and for three months of the nursing period. No symptoms of unthriftiness or illness developed in either the mare or the foal.

Mare 8 was delivered to the University on June 22, 1938. The foal was born May 9, 1938. This mare was fed the basal ration of grain, hay and pasture plus 3.5 Gm. of zinc lactate daily from June 23, 1938, to February 1, 1939, or approximately 1.5 lb. of the lactate in about 220 days. Zinc lactate was fed throughout the nursing pe-

riod and the colt was weaned November 18, 1938. This mare was bred on June 29 and again on July 2, 1938. Several months later she was pronounced nonpregnant and daily zinc feeding was discontinued on January 31, 1939. The belief that mare 8 was not with foal proved to be in error, for she gave birth to a live foal late in the summer of 1939. This foal was normal at birth and remained healthy during the nursing period and for three months of observation after weaning. Symptoms of unthriftiness or illness were not manifested by either the mare or her two foals during the course of the investigation.

Mare 131: No foal was born in 1938. Grain, hay and pasture plus 3.5 Gm. of zinc lactate were fed daily to this mare from August 1, 1938, to February 1, 1939, or approximately 1.3 lb. of the lactate in about

180 days. She was bred twice during the month of July 1938, but on examination several months later, proved nonpregnant. No symptoms of unthriftiness or illness developed in the mare as a result of the zinc-lactate feeding.

Mare 57 and her foal were purchased in central Illinois by the division of animal pathology and hygiene. This mare and foal (born July 6, 1938) were delivered to the University on July 13, 1938. Mare 57 received the basal ration of grain, hay and pasture plus 35 Gm. (540 gr.) of zinc lactate daily from August 1, 1938, to September 1, 1939, or approximately 28 lb. of zinc lactate in about 390 days. The 1938 foal did not at any time show symptoms of unthriftiness or illness either before or after weaning, and the mare remained in excellent condition during the entire period of zinc-lactate feeding. It should be noted that the amount of zinc lactate fed daily to this mare was ten times greater than the amounts fed to mares 79, 89, 8 and 131. Zinc lactate was fed at the rate of 35 Gm. daily throughout the nursing period of the 1938 foal. This colt was weaned on October 18, 1938. The mare was bred on July 15, 1938, and foaled June 4, 1939. This foal was normal at birth but developed contracted tendons when about 2 months of age. The contracted tendons responded to treatment with pressure bandages and, apparently, this deformity was not associated with the feeding of zinc lactate. No other symptoms developed in the foal and both the mare and the foal were pronounced healthy when the final observations were made three months after the close of the investigation.

Mare 7 also was purchased by the division of animal pathology and hygiene. A weak foal was born on July 13, 1938, and died on July 19, 1938. The autopsy findings confirmed pyemia infection *via* the navel as the cause of death. This mare received the basal ration of grain, hay and pasture plus 35 Gm. of zinc lactate daily from August 23, 1938, to September 1, 1939, or approximately 30 lb. of zinc lactate in about 412 days. She was bred several times between August 8 and August 16, 1938, and foaled on June 25, 1939. This colt was weak when

born and died on June 27, 1939. Autopsy revealed a severe impaction of the colon. The mare did not show any ill effects from the feeding of zinc lactate and the deaths of the two foals were not attributed to zinc. Mare 7 was 10 years of age and blind. She died while at pasture on September 19, 1939. An autopsy was not conducted but it was presumed that she had fallen over a low embankment and sustained a broken neck.

DISCUSSION

In appraising the effect of zinc in the diet of pregnant mares and mares nursing foals, it was believed that clinical observa-

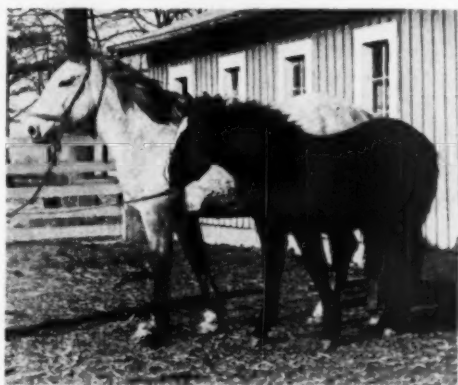


Fig. 4. Mare 57 and foal, photographed 12-28-38 after approximately five months of zinc feeding. Foal born 7-6-38; weaned 10-18-38.

tions and laboratory tests of the blood, milk, urine and feces of the mares fed zinc lactate would serve as acceptable bases for the interpretation of abnormal changes that might develop in the nursing colts. The nature of the problem, the species, the age and the sex of the animals used, as well as the available facilities for the work, were such that it was not feasible to undertake zinc-balance studies—procedures that would have made it possible to determine the amount of zinc absorbed and stored in the body tissues and the amounts of zinc eliminated in the urine, milk and feces. An attempt was made, however, to have the conditions for the experimental trials as comparable as possible with those which prevailed at the time the colts were naturally affected with the disease. Cecil Drinker

of Harvard University, an authority on zinc metabolism and consulting physiologist for this investigation, approved the use of zinc lactate as a satisfactory source of zinc for the experimental feeding. The results, therefore, appear to represent a reasonably accurate appraisal of the relationship of zinc to the disease observed in the two colts, though it is rec-

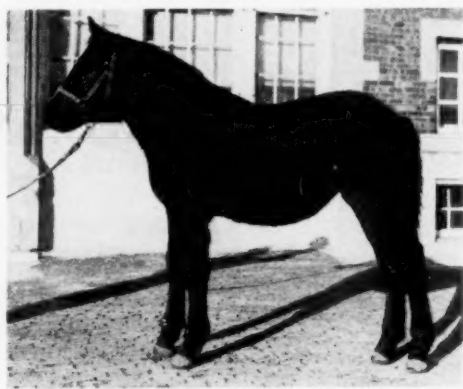


Fig. 5. Foal (1939) of mare 57, photographed 12-13-39. Foal born 6-4-39.

ognized that a larger number of animals would add to the strength of the findings.

Clinical Observations.—The results of the study, from both a clinical and a laboratory standpoint, failed to demonstrate that zinc produces harmful effects when fed to pregnant mares or to mares suckling colts in either 3.5- or 35-Gm. (54- or 540-gr.) doses of zinc lactate daily for extended periods varying from 180 days to 400 days. One nursing colt, No. 57C, whose dam was maintained on a zinc intake of 35 Gm. of zinc lactate per day, developed contracted tendons. That this condition was probably not associated with the feeding of zinc lactate to the dam is suggested by the fact that the colt responded to treatment with pressure bandages. Improvement following treatment was rapid and the animal recovered. Furthermore, this disorder (contracted tendons) has been observed occasionally in foals over a period of years and under conditions that would seem to exclude zinc as a causative factor.

Chemical Examinations.—Only small amounts of zinc were found by chemical analysis to be eliminated in the milk and

in the urine of the mares receiving zinc lactate in this experimental study, in contrast to the large amounts of zinc found in the milk and in the urine of the mares nursing the colts (laboratory specimens 6681-82) affected with the disease in November 1937 (table I). It is pertinent, therefore, to inquire why there should be this striking difference. There may be several explanations. The source of the zinc found in the milk from the mares in November 1937 was not established. By "source" is meant simply that the chemical nature of the zinc presumably consumed or in some manner acquired by the mares, stored in their tissues, and later eliminated in the milk and urine was not determined. In an extensive review of the investigations on zinc excretion from the animal body, Drinker, Thompson and Marsh³ state:

Summarizing briefly the opinions expressed in the literature in regard to the excretion of zinc, we may say that absorbed zinc begins to be excreted promptly after the absorption. A small fraction leaves the body in the urine; the major amount, however, is excreted along the alimentary tract, some of it in the bile, possibly some of it in the pancreatic juice. If the absorbed zinc is greater in amount than the excretory mechanism can handle at once, zinc is temporarily stored, chiefly in the liver, and liberated by this organ as fast as it can conveniently be excreted. A small amount of zinc is excreted in sweat and probably some also in milk.

On the basis of results obtained from studies on zinc ingestion in cats and dogs, Drinker and his associates further state:

Our studies upon zinc excretion in zinc-fed animals indicate that a small fraction of absorbed zinc leaves the body in the urine, but that the main bulk of it is excreted into the alimentary tract—some of it directly, some of it by the liver into the bile, and possibly some of it by the pancreas—and ultimately leaves the body in the feces. The amount of zinc in the urine of zinc-fed animals is markedly increased over the normal, though the total amount of zinc in the urine is but a small fraction of the total excreted.

The findings of Drinker *et al*, and the opinions credited to other investigators by

³Drinker, K. R., Thompson, P. K., and Marsh, M.: Amer. Jour. Physiol., lxxx (1927), 1, pp. 31-64.

these authors, on the excretion of zinc suggest that the amount of zinc consumed is the determining factor as to the channels used by the body in ridding itself of any excess quantity that may be absorbed and stored in the body tissues.

There was considerable fluctuation in the amounts of zinc excreted in the feces, but zinc feeding apparently resulted in an increase in the amount of the metal eliminated by this channel.

Zinc feeding did not affect the normal levels of calcium and inorganic phosphorus in the blood of either the mares or the foals.

The red and white blood cells were not affected. There appeared to be a tendency for a decrease in the number of white cells during the period of zinc feeding, but this decrease may have been due to physiological causes.

There was no evidence, on the basis of examinations of urine for pathological constituents, that zinc feeding caused any harmful effect upon the urogenital system in either the mares or the foals.

SUMMARY

The summary of the results of feeding zinc lactate to pregnant mares and mares nursing foals is presented in table I. It is recognized that additional studies on the effect of zinc feeding on reproduction in mares as well as the effect on nursing foals may be desirable, and that the results of further studies may modify the present conclusions. However, it can be said with reference to the results to date that no experimental evidence was obtained in feeding zinc lactate to six pregnant mares or to mares nursing foals over a period of 2½ years to support the conjecture that the fatal illness observed in the two colts (1937) from the farm near Depue, Ill. (laboratory specimens 6681-82) was due to zinc poisoning. Stated in another way, zinc in the amounts (3.5 and 35 Gm. [54 and 540 gr.] of zinc lactate) fed daily to pregnant mares and mares nursing foals failed to induce symptoms of illness in either the mares or the suckling foals. The preliminary results of zinc feeding to the

six pregnant mares and mares nursing foals are in agreement with the results reported by Thompson *et al*¹ on experimental zinc feeding of pregnant and lactating albino rats.

In view of the negative results in feeding zinc to pregnant mares and mares nursing foals, it seems reasonable to conclude that the naturally affected colts suffered from some factor or factors other than zinc poisoning. Furthermore, in the light of the negative results on feeding zinc lactate to pregnant mares and mares nursing foals, and in view of the advanced arthritic lesions observed in the naturally affected colts at autopsy, it is believed that efforts in the diagnosis of any future cases of the "colt disease" should give careful consideration to the possible significance of parasitic infections as encountered in the naturally affected colts. Special attention should be given to superimposed, localized bacterial infection of the joints resulting in arthritis as observed in the two naturally affected colts.

It may be significant to mention that advanced arthritic lesions accompanied by erosion of the articular cartilages, or grossly indistinguishable arthritic lesions, observed in the colts, have been observed in calves since the studies on the colt disease were inaugurated. In a study of the naturally affected calves, bacterial agents have been incriminated. In further support of the advisability of stressing the bacterial approach in the ultimate solution of future cases of the naturally occurring colt disease, it may be acknowledged that we know of no other agent or agents at the present time, in the field of animal pathology, capable of inducing this type of arthritic lesion in young animals. Failure to find offending bacterial invaders in the terminal stages of the natural colt disease does not preclude the presence of certain pathogenic bacteria in the early active stages of infection. In further explanation of negative bacterial findings, it is recognized that the defense mechanism of the host can conceivably overcome a prevailing focal infection and subsequently succumb to the liberated bacterial toxins.

The Bacteriological Diagnosis of Infectious Encephalomyelitis (= Derriengue) of Horses

By FERNANDO CAMARGO,* D.V.M.

Mexico City, Mexico

SEVERAL REPORTS concerning infectious encephalomyelitis have drawn attention to the occurrence of this disease in different species of animals, including the horse; however, no comparison has been made between the clinical observations and the laboratory findings. This is the object of this report.

During November 1935, an epizootic of infectious encephalomyelitis was observed in the state of Oaxaca. Manuel Chavarria made clinical observations and collected material for laboratory examination. The horses observed during this epizootic manifested a train of symptoms similar to those exhibited by cattle suffering with encephalitis.

The nervous tissues, consisting of the cerebrum, cerebellum and medulla of one horse, were collected aseptically and stored in a phosphate-glycerin solution which had a pH of 7.6.

Approximately 1 Gm. of brain tissue was reduced to a paste in a mortar with sand, emulsified with 10 cc. of physiological salt solution and then filtered through cotton. Four guinea pigs were inoculated subdurally with this emulsion, each receiving 0.2 cc. Each of four rabbits received 0.4 cc. of the same material by the same route. The guinea pigs became paralyzed on the 17th day, exhibited periods of excitement, salivated profusely and finally died on the 18th day. A suspension of nervous tissue from this group was inoculated into another group of four guinea pigs. They died on the 16th day after inoculation. A third group, inoculated with material from the second, died on the 13th day. A fourth group were inoculated with material from the third group and the period of incubation was only eight days.

Fifteen passages were made in all and

the period of incubation remained at eight days. Thus, the virus became fixed after the fourth passage. The rabbits sickened on the 22nd day and died on the 23rd and 24th days after inoculation. Additional rabbits were not inoculated, since the guinea pig has proved to be more susceptible to this particular virus.

As a means of differentiating derriengue from equine encephalomyelitis, ten pigeons were inoculated with nervous material collected during the epizootic. None of the test birds developed ataxia, paralysis or other symptoms suggestive of encephalomyelitis. It has been shown by Giltner and Shahan of the Bureau of Animal Industry, U. S. Department of Agriculture, that pigeons are susceptible to equine encephalomyelitis virus but not to the virus of derriengue.

CONCLUSIONS

1) Horses are susceptible to derriengue and may become infected through natural exposure.

2) The virus isolated from clinical cases of the equine disease behaves in the same way as the agent isolated from cattle suffering with encephalitis (=derriengue) and, therefore, it is believed that one virus is responsible for the infection in both cattle and horses.

3) The viruses of derriengue and equine encephalomyelitis are immunologically distinct.

In 1913, it took but 31 lb. of hogs to buy 100 lb. of 8-penny nails. In 1940, though nails haven't changed, it takes 70 lb. of hogs to buy 100 lb. of them, an increase of 126 per cent. Similar comparisons for other necessities in farming made by Secretary Wallace convinced a senate committee that farmers are entitled to "parity" payments, until there is a parity of farm prices and prices farmers pay.

*Veterinary doctor of the Animal Health Bureau, Biotechnic Institute.

CLINICAL DATA

Sulfanilamide in Small Animal Practice*

By W. R. ECKER, D.V.M.

Newark, N. J.

IN THE SMALL animal field there seems to be a difference of opinion as to what constitutes the correct dose of sulfanilamide and the same applies as to how long the drug should be used. Of course, we realize that the dosage should depend upon a blood-sulfanilamide level of 1:5,000 to 1:10,000 and the rate of excretion of the drug in the urine. However, most of us are not equipped to determine the dosage on a basis of laboratory tests. We depend upon the body weight as a guide and for all practical purposes this has proved adequate.

In reading numerous articles on sulfanilamide, I am impressed by the conservative dose schedules that are recommended. The one most frequently suggested is 0.5 to 1 gr. per lb. of body weight each 24 hours. Our English colleagues recommend the following schedule: 1 Gm. (15 gr.) per 10 lb. of body weight for two days, 0.65 Gm. (10 gr.) per 10 lb. of body weight for three days, and 0.32 Gm. (5 gr.) per 10 lb. of body weight for about five to seven days. We follow this schedule closely in most cases, though larger doses are often given. In some cases we give larger initial doses over a longer period of time, and toxic symptoms rarely occur.

The symptoms we observe are usually an unsteady gait or weakness in the hind legs, vomiting and cyanosis. Following the discontinuance of the drug, these symptoms disappear in about 24 hours without leaving any ill effect. Treatment can, if necessary, be resumed in 48 hours with smaller doses.

Recently, and I presume others have had

the same experience, many sick dogs have been brought to our hospital with a history of chills, fever, anorexia and listlessness, and in some cases vomiting, difficulty in swallowing and diarrhea.

On examination we find two outstanding symptoms: a temperature ranging from 104° to 106° F., and greatly enlarged, inflamed tonsils, sometimes the size of walnuts. These were cases of streptococcal tonsillitis confirmed by laboratory examinations. By the proper use of sulfanilamide in these cases, recovery occurred in about 48 to 72 hours. Improvement was manifested by a drop of the temperature to normal and a desire for food.

Another suggested use for sulfanilamide is its direct application to infected wounds. The first case was a cat suffering from an infection between the toes. The wound was incised liberally, cleansed and treated with a wet dressing. The following day when the dressing was removed the wound was found covered with a heavy, gelatinous, purulent exudate. The wound was cleansed again and another wet dressing applied. As the wound was worse the next day, we cleansed it again, applied sulfanilamide powder and covered it with a bandage. The following day the wound was clean, bright red, healthy. Though requiring no further attention, the wound was redressed the next day and the cat discharged.

Another case was that of a Fox Terrier brought into the hospital following an automobile accident. The skin on the right side of the chest had a 4-in. gaping laceration. We cleansed the area and applied a few sutures in the upper part of the tear. The owner insisted on taking the

*Presented at the 56th annual meeting of the New Jersey Veterinary Medical Association, Newark, N. J., January 16-17, 1940.

animal home. Four days later when the patient was returned, pus was pouring from the wound and this time the owner consented to hospitalization. We cleansed the area, probed the wound to determine to what extent the infection had spread under the skin, made four liberal incisions to establish drainage, and removed sloughed fascia and fat. Vaseline-gauze drains were tied through the openings and the area thoroughly irrigated. A copious amount of pus was discharging the next morning, the area was thoroughly irrigated and new drains inserted. During the day the openings were irrigated with the B.A. solution. The following morning the discharge of pus was as copious as on the previous day. The infected area under the skin was cleansed and sulfanilamide deposited with the aid of a wooden spatula. No other treatment was given at this time. The next morning, much to our surprise, the discharge had ceased and the tissues were bright red and healthy in appearance. We again applied the powder, although it did not appear necessary. The case was discharged with no further treatment.

The Use of Hypertonic Sucrose in Anaphylactic-Like Shock in Serum-Producing Horses*

By J. A. McCOMB, D.V.M.

Jamaica Plain, Mass.

AMONG a group of horses producing anti-pneumococcic serum, occasionally a fatal shock will occur following an injection of a saline suspension of killed pneumococci. This may happen from within a few minutes to several hours after intravenous injection of the vaccine.

At the state laboratory in Massachusetts various things have been tried, with little success. Adrenalin and dextrose have been used both prior to and after injection. In horses suddenly showing severe dyspnea there were practically no recoveries. Autopsies on them revealed chiefly congestion

*From the antitoxin and vaccine laboratory of the Massachusetts department of public health.

and edema of the lungs with some hemorrhages.

Recently sucrose was suggested. As a foreign sugar it had the advantage over dextrose of much slower elimination. Sucrose has been used in two cases, with a dosage of about 400 cc. of a 50 per cent solution.

The first case was apparently recovering but was found dead in the stall the next morning.

The second case, with extremely difficult respiration and drenched with perspiration, seemed out of distress within about 15 minutes following injection of the syrup and made a complete recovery.

While this has been used on only two cases by us, I was prompted to send in this note after reading an interesting account of partial recovery followed by relapse and death in so-called "corn stalk" disease. This partial recovery was attributed to dextrose by W. A. Aitken in the March 1940 issue of the JOURNAL [pp. 300-304].

Although repeated injections of sucrose are said to be harmful to the kidney tubules, a single injection might be worthy of trial.

Wartime Mange

The description of a sulfuration chamber such as was used on a large scale by the French and American troops during the World War I is described by a war correspondent for *Le Temps*. Mention of this apparatus for treating mange indicates several things of considerable importance, namely: a) Horses are used in large numbers in the present military operations, b) mange is still a wartime equine scourge, and c) sulfur-gas treatment has stood the test of time and experience.

In a war of movement when the weather is not extremely favorable the use of dipping vats is deadly to weakened horses and mules. For the treatment of large numbers, the sulfuration method is the only known substitute. Hand treatment is entirely too time-consuming. Though manpower may seem plentiful in wartime, the opposite is true. There is always a shortage of men in the zone of communication.

Moderate Amounts of Lead-Arsenate-Sprayed Apples Noninjurious to Swine*

By ERNEST C. McCULLOCH, D.V.M., Ph.D., J. L. ST. JOHN, Ph.D., and
KERMIT GROVES, Ph.D.

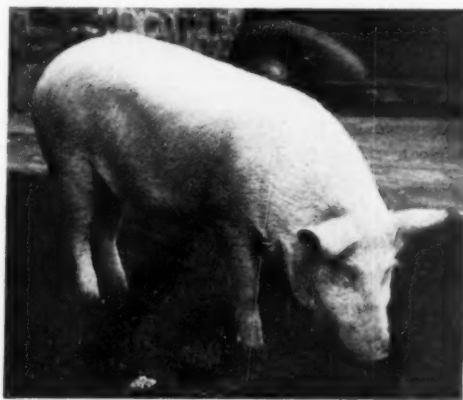
Pullman, Wash.

THE ACUTE POISONING of sheep and cattle that had engorged upon forage containing extremely high concentrations of lead-arsenate-spray residue previously has been reported.^{1, 2} The possible hazard of lead-arsenate poisoning as a result of feeding moderate amounts of sprayed fruit is of economic importance to orchardists and to swine raisers and veterinarians in those regions where apples and pears are raised commercially. Orchard sanitation demands the destruction of the apples which fall from the trees, since the majority of such apples are worm-infested, and the development of the worms continues in the fallen apples. In addition, low prices occasionally make it economically advisable to utilize more of the inferior grades of sprayed fruit as animal feed. The removal of the spray residue from apples and pears used for animal feed adds materially to the expense.

A study, therefore, was made of the toxicity to swine of the lead-arsenate-spray residue contained on heavily sprayed apples.

The feeding of apples containing lead-arsenate-spray residue was commenced November 5, 1939, with a Chester White gilt, approximately 5 months old and weighing 101 lb. that previously had been fed a ration very high in Triplet wheat. Because it was desired to feed lead-arsenate-spray residue in excess of the amount contained on the quantities of apples which could safely be included in the ration, most

of the apples were peeled with the stem and blossom ends included with the peelings, and these were fed. These peelings contained nearly all of the lead-arsenate-spray residue present on the apples. Five per cent of each box of apples were peeled in a similar manner, the peelings placed in jars, weighed and analyzed for lead and for arsenic. From these data, the total arsenic and lead consumption of the pig was calculated. The data obtained are contained in table I. Feeding of the apples was suspended the week of January 21 because of



After consuming 13.388 Gm. (206.6 gr.) of arsenic and 29.064 Gm. (448.5 gr.) of lead in the form of residue on sprayed apples, in 20 weeks, this pig remained in excellent condition.

the failure of a shipment of apples to arrive on schedule.

The pig remained in excellent condition throughout the entire experiment and still was in excellent condition and weighed 184 lb. on April 30, 1940 (fig. 1), when the experiment was temporarily suspended because no more heavily sprayed, unwashed apples could be obtained. At no time was there any indication of arsenic or lead poisoning. The blood cells were regularly examined for evidence of the stippling

*From the Division of Veterinary Science and the Division of Chemistry of the Washington Agricultural Experiment Station, State College of Washington.

¹McCulloch, E. C., and St. John, J. L.: Lead-arsenate poisoning of sheep and cattle. *J.A.V.M.A.*, xvi (March 1940), pp. 321-326.

²St. John, J. L., McCulloch, E. C., Sotola, J., and Todhunter, E. N.: *Jour. Agr. Res.*, ix (March 1, 1940), pp. 317-329.

Table I—Results of feeding lead-arsenate-spray residue.

WEEK OF	APPLES PEELED, POUNDS	GRAMS ARSENIC	GRAMS LEAD	WEIGHT OF PIG, POUNDS	BLOOD CELL COUNTS CMM.	
					RED	WHITE
Nov. 5*	33	0.393	0.79	101	6,890,000	13,400
Nov. 12*	33	0.393	0.79	104		
Nov. 19*	33	0.393	0.79	105	6,590,000	16,350
Nov. 26	65.8	0.70	1.48	105	6,750,000	15,000
Dec. 3	35	0.47	0.95	106		
Dec. 10	72	0.76	1.74	114.5	5,010,000	12,500
Dec. 17	60	0.74	1.58	117		
Dec. 24	48	0.93	2.02	121		
Dec. 31	48	0.87	1.86	127		
Jan. 7	48	0.53	1.128	130	5,870,000	15,500
Jan. 14	52	0.662	1.384	134.5	6,050,000	15,100
Jan. 21	0	0	0	136	6,210,000	18,800
Jan. 28	34	0.486	1.436	140		
Feb. 4	38	0.722	1.434	142	5,640,000	21,600
Feb. 11	40.5	0.312	0.654	145	6,450,000	17,100
Feb. 18	39.5	0.766	1.668	146	6,100,000	18,000
Feb. 25	86	0.924	1.978	152	6,030,000	17,800
March 3	81	1.078	2.350	160	5,980,000	18,450
March 10	78	1.162	2.588	162		
March 17	84	1.136	2.484	164.5	6,420,000	15,950
	1,008.8	13.407	29.104			

*The samples for the weeks of November 5, 12 and 19 were mixed and the totals are divided among these three weeks.

which frequently is the first indication of lead poisoning. When suitable sprayed apples again are obtainable, it is planned to continue this experiment for a much longer period or until there is some evidence of poisoning produced.

These data indicate that lead-arsenate-spray residue, representing 1.47 gr. of arsenic and 3.2 gr. of lead, which are equivalent to the consumption of 7.2 lb. of apples carrying an average residue of 0.205 gr. of arsenic trioxide and 0.445 gr. of lead per pound, fed daily for 140 days to a pig weighing between 101 lb. and 164.5 lb., had no detectable effect. This suggests the possibility that the arsenic and the lead which remain on apples as spray residue are relatively nontoxic. Additional work is being carried on to ascertain the amounts of arsenic and of lead that are retained by swine fed lead-arsenate-spray residue, both with and without substantial amounts of apples in the ration.

The tolerance of swine to lead-arsenate-spray residues is of further interest because of the closer physiological and anatomical relationships between man and swine than between man and the laboratory

animals that have been used in most of the feeding trials heretofore reported.

Vitamin B Complex and Psychoses

The vitamin B complex is now known to contain five distinctly separate chemical ingredients, namely: thiamin, riboflavin, nicotinic acid, pyridoxine and pantothenic acid. The last two are also known as vitamin B₆.

The nicotinic acid part of the complex cures many cases of psychotic illness manifested by mental confusion, disorientation and apprehension, according to W. H. Sebrell, M. D., of the United States Public Health Service in his report to the American Scientific Congress.

In addition to the five known factors of the B complex accumulating from recent investigational work are vitamin B₄, vitamin H, the adrenal necrosis factor, the anti-gray hair factor, the anti-hemorrhagic factor, factor U, factor W and possibly others. To prevent all of these deficiencies, all that is necessary is an adequate diet. Dr. Sebrell stated.—*From Daily Digest, USDA.*

Ascariasis in a Giant Panda (= *Ailuropus Melanoleucus*)*

By C. S. LO and T. Y. HSIA

Chungking, China

FOR THE PAST two years we have had the rare opportunity of observing the health and disease conditions of over a dozen captive giant pandas. The animals were owned by Mr. Smith, field collector for the Royal Zoölogical Society of London. During that period, several of them died, and we autopsied two of them. In each case we found varying numbers of mature ascarids in the small intestine.

Last June, Mr. Smith presented an adult female animal to the Academia Sinica of the national government. The animal was kept in the premises of the provincial bureau of animal industry for about a year. One of the writers (C. S. L.) was asked to supervise the feeding and management of the animal. This panda was apparently in constant good health. On one occasion, however, she became ill, but after vomiting a mass of ascarids she immediately recovered.

The worms collected were studied roughly by the junior author. Because of the lack of facilities, we did not attempt to study the case in detail, but from the little information we gathered and from casual observations by T. S. Hsiung, parasitologist of the bureau, we are inclined to think that the worm concerned is a new species not previously reported in the literature.

The animal passed one or two mature ascarids at irregular intervals during defecation. The worms were intact but dead. Fecal examination revealed ascarid ova. In spite of the infection, she was in good condition. Occasionally, she had a brief spell of inappetence, but in two or three days she would regain her normal appetite.

On the morning of January 17, 1939, the subject appeared ill and did not partake of the morning meal. When her favorite food—corn-in-cob—was offered, she did not even glance at it. Water also was refused.

She was evidently in distress and resisted attention. She sat on her haunches, with the head curled down to the chest and hidden between the two forelegs. Occasionally, retching movements were observed. Due to the resistance of the animal, a detailed examination could not be made. Normally, the animal is not vicious, but when irritated, she can do considerable damage with her powerful, sharp claws. They are the panda's most effective defense weapon.

When the panda was seen two hours later, her attitude was completely changed. She dozed in perfect contentment. The morning meal and three ears of corn had been consumed. She drank water eagerly. It was difficult to determine what had caused the change. Upon looking around the bedding, which consisted of rice straw, we found a semisolid, yellowish-white, cheesy mass the size of a palm. About 30 adult ascarids were found interwoven in this mass.

From the specimens collected—those at the autopsy and from the vomitus—studies were made on the size of the adult worms and the measurement of the eggs. The average measurements of the male adult worms were as follows: Length, 69.65 mm.; thickness of the body, 1.89 mm.; thickness of the head, .57 mm. The average measurements of the female worms were: Length, 106 mm.; thickness of the body, 3.06 mm.; thickness of the head, .71 mm.; from head to vulva, 30.7 mm.; from vulva to end, 75.4 mm. The eggs measured, on the average, 73.5 μ in length and 49 μ in width; the albuminous shell was 3.04 μ thick and the cuticle shell, 3.91 μ thick.

None of the medical specialties has been as greatly influenced by the development of vitaminotherapy as ophthalmology. Vitamins A, B, C and D have their special indications in serious ocular ailments.

*From the Department of Veterinary Medicine and Animal Husbandry, College of Agriculture, National Central University.

SURGERY & OBSTETRICS

Paravertebral Lumbar Anesthesia in the Bovine Species*

By J. FARQUHARSON, D.V.M.

Fort Collins, Colo.

THE VARIOUS methods of nerve blocking should receive further attention because of their adaptability to general practice. Some of our present procedures have been inadequate in certain surgical operations. Surgical therapy is confronted with diagnosis, surgical technic, including pre- and post-operative care, and anesthesia. No notable progress has been made in regional anesthesia in veterinary surgery since the introduction of epidural or caudal anesthesia by Benesch (1926).

The use of any anesthesia demands deliberation, preparation and experience. The choice of an anesthetic should be based on the knowledge of which will cause the least amount of injury, local or systemic, and which offers the greatest margin of safety to both the operator and the animal. Perfection of surgical skill can be attained only by perfect anesthesia. There should be no place for "acrobatic" or "slice and duck" surgery performed without any or with partial anesthesia. Good anesthesia is the best method of restraint known, and without it good surgery is impossible.

To attempt to administer local anesthesia incautiously and have it fail in its purpose presents an embarrassing picture to the client and causes the surgeon to lose confidence in his ability. Thereupon he resorts in the future to even more crude methods, or the anesthetic receives wholesale and undeserved condemnation. Too frequently, because of poor anesthesia, a promising surgical operation becomes a burlesque, resulting in ignominious failure.

Since the veterinarian is handicapped by

the lack of help of trained anesthetists, general anesthesia is commonly administered by the untrained, even though it is the least safe. This being true, the veterinarian should be encouraged to use local anesthesia more than is now generally in vogue. It is needless to imply that regional anesthesia will supplant general anesthesia. Nevertheless, general anesthesia and regional anesthesia may commonly be used in combination, general anesthesia thus increasing rather than limiting the scope of regional anesthesia. There can be no haphazard administration of local anesthesia. It is a precise, definite surgical procedure that demands a thorough knowledge of topographical anatomy, choice of anesthetic and skill in its administration. Such skill can be acquired only by practice and experience. Therefore, local anesthesia is preferable, provided that operations of any magnitude can be performed painlessly under its care.

METHODS

Methods of producing local anesthesia are constantly undergoing revision. Regional anesthesia is the result of certain surgical procedures, accomplished by injecting an anesthetic solution in the immediate vicinity of nerves for the purpose of rendering the part temporarily painless, by inhibiting the conductivity of the sensory nerves in any particular region in the body.

Regional anesthesia can be accomplished in two ways. The first is the "field block," which consists of infiltrating the tissues locally by encircling the field with a series of injections of an anesthetic in various depth of planes. This method is an effort

*From the veterinary division of Colorado State College.

to block off the desired field with no particular reference to the principal nerve trunks. The second method is the "nerve block," which consists of injecting the anesthetic solution in close proximity to nerves (either paraneural or immediately extraneural) to shut off conductivity of the region supplied. The site of injection may be remote to the field of operation. In veterinary surgery this method usually is the one of choice, since it eliminates the edema of tissues where the incision is to be made.

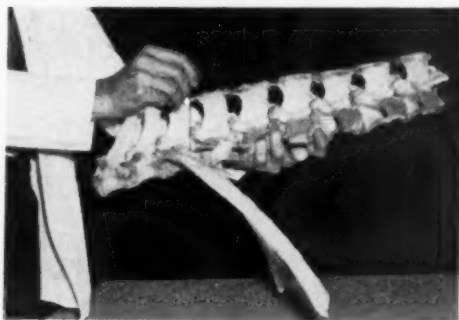
Paravertebral anesthesia consists of injecting an anesthetic solution immediately at the emergence of the nerve trunks from the intervertebral foramina, cutting off their conductivity close to the spinal column. This form of regional block may be applied to any of the spinal nerves and is designated according to that region of the vertebral segment from which they spring. Thus blocking the thoracic nerves is termed "paravertebral thoracic block" and that of the lumbar nerves is "paravertebral lumbar block."

For operations, such as a laparotomy, rumenotomy or cesarean section, involving the region of the flank of the cow, we have in the past relied more or less on a field block consisting of establishing walls of anesthesia encircling the operative field or along the line of the intended incision. This is particularly true in instances where it is desirable to have the animal remain in a standing position. This method of field block or terminal infiltration has been far from satisfactory on such a large operative field. The skin can always be thoroughly blocked but certain areas between the skin and the peritoneum may escape good infiltration. The peritoneum is seldom anesthetized so that blocks of this nature have been "spotty" and not all that is to be desired. Such a block most frequently necessitates additional means of restraint. Furthermore, retraction of muscles is usually a cause of ragged incisions. Also, the entire operative field is heavily infiltrated with the anesthetic solution, which causes additional injury to the tissues and, undoubtedly, delays primary union.

Paravertebral lumbar block serves for

anesthetization of the abdominal wall and its peritoneum. It brings about relaxation of the abdominal wall by bathing the last thoracic and first two lumbar nerves with a local anesthetic at their points of emergence from their respective intervertebral foramina.

This form of anesthesia not only anesthetizes the abdominal wall but also desensitizes the corresponding abdominal viscera through the rami communicantes, which, in turn, is due to the sympathetic block. This decreases intraabdominal pressure, a very desirable feature. It permits a flank operation to be performed in the standing position and no additional form of anesthesia or restraint is necessary. The bovine species is a particularly apt subject for para-



Lateral view, showing needle in position for injection of the 13th (last) thoracic nerve.

vertebral block because the prominences of the spinous processes serve as valuable landmarks.

ANATOMICAL CONSIDERATIONS

In paravertebral lumbar nerve blocking, one must be familiar with the principal nerve trunks and their distribution. The position of each nerve trunk should be correlated to fixed bony landmarks in particular.

The region most commonly selected for abdominal operations in the bovine species is the paralumbar fossa. This area extends from the last rib anteriorly to the tuber coxae and thigh posteriorly, and from the transverse processes of the lumbar vertebrae ventrally. This area is supplied by the ventral branches of the last thoracic and first two lumbar nerves. Operations per-

formed on the ventral surface of the abdomen require blocking of additional thoracic nerves ahead of this region.

The last thoracic and first lumbar intervertebral foramina are occasionally double in the cow. The last thoracic intervertebral foramen lies immediately posterior to the head of the last rib and on a level with the base of the transverse process of the first lumbar vertebra. The intervertebral foramina of the lumbar series are large and are located between the bases of the transverse processes, and approximately on the

cent nerve will overlap the area supplied by the particular nerve blocked.

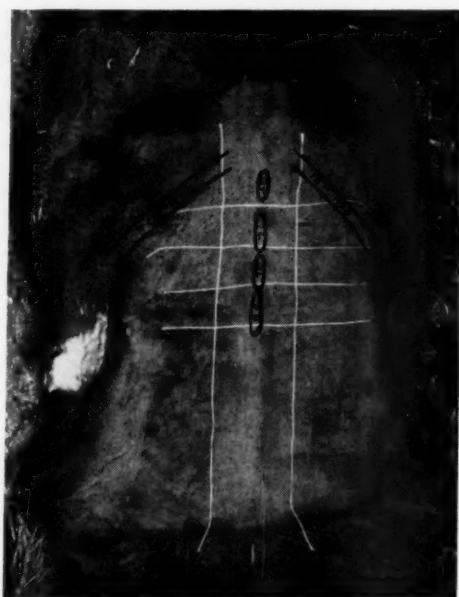
EQUIPMENT AND TECHNIC

The purpose of paralumbar anesthesia is to inject the nerves at their point of emergence from their respective intervertebral foramina. The necessary equipment is a 10-cc. sterile syringe, a 4-in, 20- and 22-gauge needle, and a 1-in, 16-gauge needle. A 2 per cent procaine solution is used; however, any reliable local anesthetic will suffice.

The superficial landmarks are the spinous processes of the first two lumbar vertebrae and the last rib. The transverse processes, although easily palpated, are unreliable because of their curvature. By following the last rib upward with the index finger, the head of the rib can be accurately located 2 in. lateral to the median line which marks the site of injection.

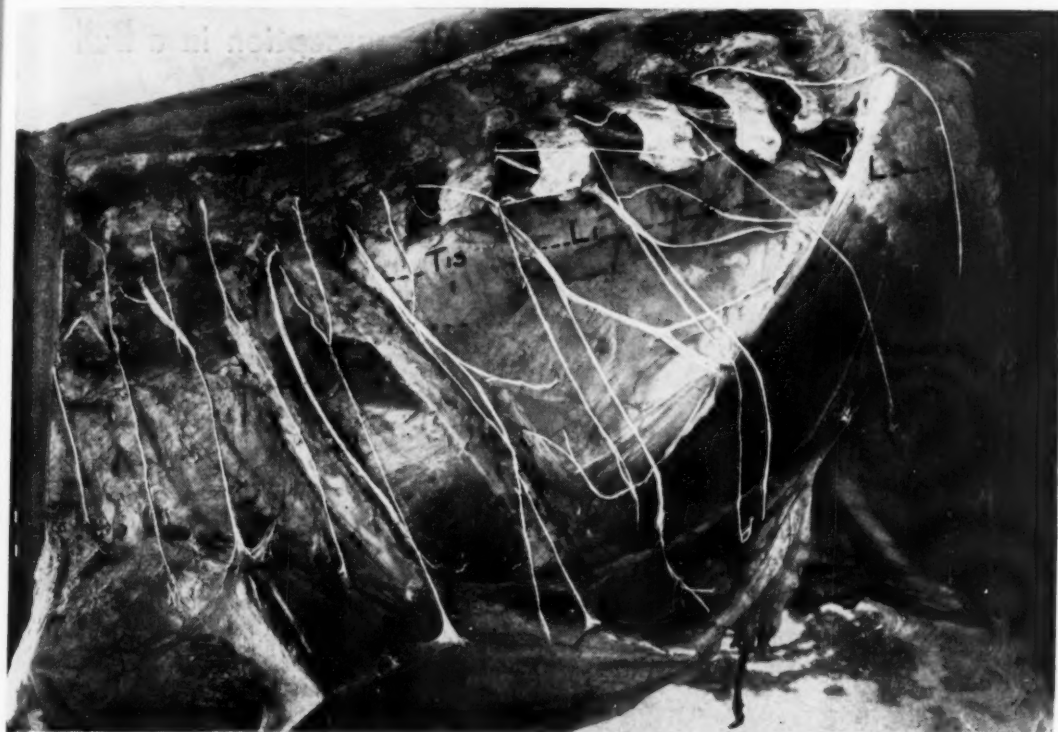
To locate the site of injection for the first two lumbar nerves, a line is drawn transversely to the posterior border of the summits of the first and second lumbar spinous processes. Two in. lateral to the median line on these intersections will be the sites for injection. The hair is clipped at these points and the area disinfected with any reliable disinfectant. With the landmarks fixed, a 16-gauge needle is inserted through the skin only, creating a passage for the smaller long needle, because the skin is so thick and resistant that the regular needle bends under the pressure required to push it through the skin. The long needle is then inserted directly downward and parallel to the median plane for about 2 in. The syringe is then connected with the needle, which is slowly advanced, and a small amount of the anesthetic solution injected.

The average depth to which the needle is advanced before contacting the nerve is about $2\frac{1}{2}$ in. This depth will vary in different animals according to their size and flesh. If the rib or a transverse process is engaged at the point of the needle, the needle should be withdrawn for a short distance and directed slightly backward. Contact with the transverse process gives one



Dorsal view; intersecting lines indicate landmarks in relation to spinous processes as sites of injection.

same level. The spinal nerves emerge from their respective foramina and immediately divide into dorsal and ventral branches. The ventral branches of these three nerves supply the skin, fascia, musculature and peritoneum in the region of the flank. The distribution of these nerves is in a downward and backward direction. Although the third lumbar nerve does not innervate the flank, a cutaneous branch of this nerve passes obliquely backward anterior to the tuber coxae. To inject one spinal nerve would be superfluous because superficial cutaneous branches of the preceding adja-



Deep view, showing distribution of nerves to the region of the flank.

a reliable gauge as to the depth of the nerve. One half of the anesthetic fluid is injected at this point, the rest being distributed by pushing the needle back and forth until the entire 10 cc. has been deposited. About 5 cc. of the anesthetic solution is injected on the third lumbar nerve to destroy the conductivity of the cutaneous branch previously referred to. The field should be tested in five to ten minutes. Slight lateral curvature of the back on the side blocked is noticed because the block also affects the motor nerves.

This form of anesthesia is simple and safe and does not involve the time that is necessary for the field block. There is considerable saving in the amount of anesthetic solution used in comparison with that of former methods. There is no other form of anesthesia or restraint necessary. The anesthetized field is completely and uniformly blocked, including the peritoneum. It brings about muscular relaxation and decreased intraabdominal pressure. The post-surgical convalescent period is shorter and

of no consequence. This method meets the requirements of every surgical operation that is performed in the region of the flank.

The Modern Black Plague

We know how to produce many things but have yet to learn how to distribute them to the jobless. The nightmare of underconsumption is the black plague of the 20th century. Strangely, the cause of underconsumption in this country is farm surpluses due to, 1) the application of science to agricultural production, 2) dislocation of foreign trade, and 3) industrial unemployment. —*Milo Perkins, U. S. Department of Agriculture.*

Although omitted as a cause of surpluses, mechanical farming would be included by Wayne Dinsmore, secretary of the Horse and Mule Association of America, who would show by carefully compiled figures that the decrease of 12 million horses and mules has thrown 48 million acres of land into the production of surplus foodstuffs.

Intestinal Anastomosis Following Intussusception in a Bull

By F. C. MYERS, D.V.M., and C. R. HOWARTH, D.V.M.

Corvallis, Ore.

INVAGINATION of the intestine in ruminants with successful surgical treatment was discussed in a recent issue of the JOURNAL. The editor's note stated that, unfortunately, this optimism had not been ratified by case reports. The following is a case report of a successful intestinal anastomosis following intussusception of the small intestine, with complete recovery in 17 days.

HISTORY AND SYMPTOMS

The subject was a 2-year-old registered Guernsey bull. The case was brought to the author's attention on March 11, 1940, and the owner stated that the bull had been sick for four or five days. The animal showed extreme abdominal pain, would kick at the abdomen and lie down and roll. There was loss of appetite, frequent defecation in small quantities and some bloating on the right side.

The owner was advised to bring the animal in for further observation and diagnosis. At this time the condition of the animal appeared to be improved. The pulse was full and regular but fast, the temperature normal. Borborygmus was absent, and no fecal material had been passed for 72 hours. The patient would not eat but would drink a little water.

DIAGNOSIS

Upon rectal examination, no fecal material was present in the rectum. A large, hard, twisted mass of intestine could be palpated slightly to the right of the median plane. A diagnosis of intussusception of the small intestine was made, and we advised the owner that surgical intervention was the only possible means of saving the animal.

SURGICAL TREATMENT

The animal was placed in stocks and the site and preparation of the field of operation was the same as for a rumenotomy, except that the right flank was used. The

area was infiltrated with a 2 per cent procaine solution and a perpendicular incision 10 in. long was made through the skin and subcutis. The internal and external oblique muscles were separated by blunt dissection and the peritoneum incised. The invaginated portion of the small intestine was quickly found. The involved portion was brought out through the incision, placed on a board covered with sterile gauze and held by an assistant.

Approximately 3.5 ft. of the intestine was found to be invaginated. The normal intestine on either side of the diseased mass was clamped with compression forceps, the jaws of which had previously been covered with rubber tubing to prevent injury. The mesenteric vessels supplying the diseased portion were then compressed and ligated. The mesentery was separated from the diseased portion, care being taken not to interfere any more than necessary with the blood supply to healthy tissues. The intestine was severed with scissors 0.5 in. from the forceps towards the diseased part, and care was taken not to let the intestinal contents enter the abdominal cavity or soil healthy tissues. The healthy cut ends of the intestine were thoroughly washed with warm physiological salt solution and the two ends united by an end-to-end anastomosis, in which we used a series of interrupted and continuous Lembert's sutures. A large amount of warm physiological salt solution was allowed to flow over the intestine.

The intestine was replaced in the abdominal cavity and the laparotomy wound was sutured as for a rumenotomy. The bull was then placed in a box stall. On the following day he was allowed to drink some water and eat a small quantity of grain mash. One gallon of mineral oil was administered with a stomach tube. On the second day after the operation the animal appeared much brighter and had several

bowel evacuations. On the third and fourth days the temperature remained normal and the animal ate grass and grain. A week after the operation the bull was eating normally, seemed bright, and had normal bowel evacuations. On the tenth day he was sent home, and a week later the owner reported that the animal was rapidly gaining in flesh and appeared normal in every way.

DISCUSSION

The authors are of the opinion that this condition is probably more common than is suspected and that the operation in bovine animals is practical for the veterinarian to perform. It may be that a number of cases of intussusception in bovine animals remain undiagnosed and, when they are, no attempt is made to correct the condition by surgical means. The operation does not require a great deal more time to perform than a rumenotomy.

Gutta Percha Wadding in Extractions

By CHAS. H. HAASJES, D.V.M.
Shelby, Mich.

THE SUBJECT was a black gelding, 10 years old, suffering from empyema of the facial sinuses of the right side due to decay of the fourth maxillary molar. The skull was bulged to such a degree as to completely efface the profile of the right facial region. The nasal fossa of the right side was entirely obstructed and of the left side, partially. Therefore, it was necessary to insert a tracheotomy tube to prevent suffocation during the operation. As the crown of the offending tooth had been broken off, forceps extraction was not possible.

Under chloral anesthesia given by the mouth, the horse was cast, the sinus trephined and the tooth repulsed. The sinuses, which contained an enormous amount of pus, were emptied by means of an additional opening made below the medial canthus. The sinuses were drained into the nasal fossa with the aid of a curved metallic sound (catheter) passed upward through the nostril to the trephine opening.

The drainage was maintained with a seton threaded through the same channel and held in place by tying its ends on the outside.

The alveolar cavity was packed with a wadding of gauze, but as the owner seemed unable to replace it daily as instructed, it was decided to use a packing of gutta percha. A quantity of this waxy material was obtained from an oral surgeon, who gave me directions as to its preparation and use. At a temperature of 130° F. the material was softened and kneaded to the proper dimensions and wedged into the alveolar cavity from within the mouth. The first plug was cast out in three days but the second one, wedged somewhat tighter, remains to serve its purpose.

References

AUTHORS' and editors' references will henceforth appear at the bottom of the column in which the superior figure or mark occurs, instead of at the end of articles as in the past. Only references marked in the text will be printed. Exceptions may have to be made now and then in the case of articles containing references in such numbers as to mar the "typographic balance" of the pages.

The style of identification in vogue will be continued, in the interest of exactitude and clarity instead of the vanity that puzzles the best librarian and completely baffles the casual reader. References should contain the name (and initials) of the authors, the title of the article, the volume (and the year as a check), the month and exact date if published more than once a month, and the page to permit quick reference. "J.A.V.M.A.," the correct abbreviation for our journal, will continue the following order and style: author's name; title of article; name of journal, abbreviated; volume and year; month and day (if necessary); page or pages.

The number of the issue is not important. It has been our custom to use lower case Roman numerals instead of bold face Arabic for the volume, and we see no reason for making any change in this arbitrary style.—*The Editor.*

EDITORIAL

The Association's Interest in Passing Events

IF FORECASTING misfortune is not popular, it is sometimes apropos. It is apropos now because the arrival of a depression in the Association's affairs seems inevitable.

The precaution: Speaking figuratively, it is not cowardly to seek shelter when signs of a storm blacken the sky. *Per contra*, it is doing the right thing at the right time.

THE FORECAST

Farmers are geared up for the production of enormous surpluses and are already seeking export markets in vain, whereas the purchasing power of a world at war is sinking to an unprecedented low. The sequel, prognosticated by capable economists and military experts, is a serious depression for American farmers—our best customers. As Captain Eddie Rickenbacker writes in *American Legion Magazine*, "It [the war] will bring about a depression that will jar our teeth loose and make the depression of 1929 a mimic by comparison."

Speaking before the annual meeting of the institute of town and country ministers in June, Phillip E. Henderson of the FSA said, "Farmers are harder hit by the European war than any other group of the nation."

About 85 per cent of the revenue the Association needs is derived from farming, to be more exact, from farm animals, the providers of food supply and wealth. The other 15 per cent comes from the nonessential animals. The revenue from these oscillates with general welfare and it can vanish almost completely as it already has in the countries at war, where the feeding of such animals is restricted or prohibited by law. An American firm established in the Argentine to furnish canned dog food for the English market, finds that outlet closed.

Whether or not a country as well supplied with food as ours would ever find it expedient to take equally radical steps is problematical, but there is no doubt that veterinarians would oppose the coming of a generation of dogless American families by guarding the idealism of the small animal branch. However, the harmful effect of low-priced live stock on general welfare and especially on the income of veterinarians in practice is a reality not to be discounted in the Association's work.

Though predicting the coming of a depression may seem like a cry of wolf, it nevertheless seems timely to study the horrors of war as they affect scientific societies, scientific progress, education, home, family circle, and the pantry, albeit the war itself is in the other fellow's front yard and its coming into our own seems remote. However, with two thirds of the world's population under arms, it is certainly unwise to feel entirely undisturbed. On the contrary, it appears sensible to do some sober thinking in view of the blackened horizon.

OUR REVENUE AND OUR WORK

If omnipotent in preserving a basic resource as claimed, the AVMA should be governed wisely. The revenue needed must be obtained, expenses cut down, and projects not related to national welfare set aside until the jittery business world recovers its equilibrium. We can not ignore the fact that the United States is preparing for war—to be more diplomatic, for national defense—and that veterinarians, engaged as they are in conservation of live stock, are expected to do their duty. Keeping our members, our advertisers, our exhibitors, our sponsors in a favorable frame of mind is a patriotic duty. This duty the executive office will not shirk.

It will go on protecting and, if possible, enlarging the revenue by all honorable means.

The largest income in the Association's history is now available and expenses under our control are being "cut to the bone." The rent for the executive office has been reduced by more than \$1,000 a year and the payroll to the lowest point in recent years. A saving of more than \$1,000 a year has been made by contracting for paper stock (body and cover) by the year. The retainer fee of \$600 a year for an attorney has been abolished. Printing and engraving are purchased under close bidding by reliable firms. Labor-saving and time-saving equipment (some still needs modernization) has been installed. While economies sacrificial to the quality and size of the JOURNAL are exceptions, none other has been overlooked.

The executive office has also undertaken to do the bookkeeping and mailing for the Women's Auxiliary without, however, interfering with its work and policies. The work consists of submitting monthly statements on the loan fund, notifying debtors of interest and principals payable, and mailing notices to members on request of the secretary-treasurer. The expense of this aid is trivial.

PROSPECTS

In view of passing events, it may not be possible to maintain a membership as large as was expected—7,000 for 1941—and it might be hard to interest advertisers in sufficient numbers to keep the JOURNAL budget balanced. We shall attempt to do both. Memberships are obtained by helpful acts, and advertisers by circulation of the JOURNAL and the buying power of its readers. Straight thinking is needed to stop stampedes of extraneous origin since, as stated above, the Association as now constituted requires a definite annual income to keep from dropping back to a drifting society lacking modern business administration.

In adopting the new constitution and administrative by-laws, the House of Representatives has a gargantuan task. It should not shut its eyes to the facts pointed out above.

Veterinary Reserve Officers Desired for Laboratory Duties

TO MEET commissioned-personnel requirements of our expanding army, the War Department is utilizing reserve officers who desire extended active duty under their reserve commissions.

The veterinary corps already has placed 27 reserve officers on active duty and during the next few weeks will add 50 more. The assignments are for one year but can be extended for a second year and possibly for an additional period if conditions warrant.

In connection with the expansion program it is proposed to utilize a few veterinary reserve officers who are specializing in laboratory work. The plan is to give officers selected for such duty a special course of three-month duration at the Army Veterinary School, Army Medical Center, Washington, D. C., commencing September 15, following which they will be assigned to various stations for laboratory duties. Veterinary reserve officers in the grades of lieutenant and captain under 35 years of age who have special laboratory training and who are interested in army service should communicate immediately with Colonel R. A. Kelser, V.C., Surgeon General's Office, Washington, D. C.

Please

IF YOU have not filled in and returned the "Vital Statistics" blank sent you for taking a census of the veterinary profession, please do so now. If the blank has been mislaid, another will be furnished. The secretary's report at the Washington session will contain some important facts on what 6,000 veterinarians do, providing the returns filed are practically complete. More than 500 members have not returned the blanks.

Meat inspectors, practitioners and field men engaged in swine-disease investigation are not overlooking the danger of contracting swine erysipelas through abrasions on the fingers and hands. See abstract on page 66.

Cavalry in Our Next War

CONTRARY to popular belief, cavalry will be of the utmost importance in the next war, according to an illuminating article in the July issue of the new *Country Life* by Major Charles S. Kilburn, U. S. A.

Declaring that those who live on the land are entitled to know if the horse has really been dealt a death-blow by the machine gun, Major Kilburn points out that the air



Whenever the candid camera tells of present military operations in Continental Europe, transport animals and frequently cavalry are much in evidence. The above is an International radiophoto of the Germans marching to the front.

armadas so greatly feared have become the tools of politicians rather than weapons of military offensive power. He cites records from Spain to point out that, with all his preponderant air force, Franco was never able to interrupt the Loyalists' supplies, never even able to put out the lights in Barcelona. He adds that the anti-tank gun has become master of the tank.

Headline strategists and tactical commentators have built up in the public a fantastic picture of the next war between first-class powers, writes Major Kilburn. With the potential destructive powers of mechanical gadgets, he says, they promise a catastrophe. And no profound analysis is necessary to understand that according to these pseudo-military authorities the horse has no function and no rôle.

"Let us view this picture in the realm of reality," he says. "True, great numbers of airplanes will darken the sky as they wing forward to their objectives. Perhaps initial destruction of property and innocent life may be frightful.

"The first bomb, its roar mingled with

failing brick and screaming inhabitants, will evoke an atmosphere of fear. The second which falls among a virile people will incite the inherent anger of that race, which leads only to retribution. The cry will be, 'A child for a child, a house for a house, a factory for a factory.' The very possibility of instant retribution will forestall practical application of the theory by which air power is used to destroy civilian as well as military resistance.

"The airplane in reality has become the tool of the politician in international affairs. Its possession, particularly in qualitative numbers, is used as a diplomatic threat rather than a weapon of military offensive power.

"Why the great cry of ever-increasing air armadas? A careful analysis would disclose the number of airplanes necessary to inflict retribution in a hostile country. When that number is reached the maintenance of great numbers is waste—or a diplomatic club."



—Radiophoto from the *Chicago Times*.

"Mechanized Blitzkrieg" on the Champs Elysées, Friday, June 14, 1940.

Actually, Major Kilburn sees the cavalry as useful as ever in times of stress or of opportunity. It fights in minutes and hours as opposed to the weeks and months of which infantry is capable. "It is while the enemy is off balance through lack of reserves or exhausted troops," he points out, "that the master, having held his cavalry fresh and capable, throws it in to produce rout and possible destruction."

Major Kilburn states in his article that

the romantic picture of cavalry charging boot to boot has long been relegated to the poets and the movies. He tells how the cavalry has been modernized, describes how it has been armed; the modern American regiment of cavalry carries 132 machine guns and more than 1,000 rifles. He cites how cavalry finds usage today as ever in times of stress or opportunity, how, indeed, it was used successfully against machine guns in Spain. He demonstrates how great air armadas have become the weapons of politicians rather than of armies and reminds his readers that the anti-tank gun is now master of the tank.

Major Kilburn describes the size and importance of cavalry in the armies of the United States, Great Britain, France, Germany, Italy, Poland, Russia, Japan. He shows how the United States retains 14 regiments of cavalry comprising 5.9 per cent of the Regular Army and 19 more in the National Guard, trained to participate in any phase of combat.

He makes this important final point:

"A theater of war has much to do with the forces which will be involved in a particular campaign. Operations in the South-western portion of the country would demand a radically different balance than would operations in the Northeastern section. Under the varied conditions where American arms may be called upon to protect national interests, it is well that the country maintains a rational balance in her arms and services, rather than going to an extreme involving expense and special equipment for operations in any particular area. The organization of the American Army appears in every way to fulfill this requirement."

Major Kilburn's article made it clear that if Americans intend to do their future fighting on their own soil, they are well prepared as far as the important cavalry arm is concerned and will be advised to continue cavalry as the important element that it is in their army today.

On page 62 is pictured a German detachment marching to the front (somewhere in Europe). It will be interesting to learn in the future to what extent a sufficient

animal transportation service contributed to the German victories, or, in other words, did the service of supply of the allied troops break down before a perfect service of the enemy?

A Magazine for Circulation Through Veterinarians to the General Public

RECENT EDITORIALS have discussed the proposal, developed by the Committee on Public Relations in 1939, of organizing a self-supporting monthly magazine which would interpret the aims and interests of veterinary medicine to the general public and at the same time provide a method of efficient and ethical promotion for individual members. As this proposal will soon be brought to a decision, it is timely to offer a brief summary of the plan.

THE PROBLEM

The broad problem, faced by veterinary medicine as a whole, is to educate the awakening American public to a proper appreciation of the social importance of veterinary science and, by doing so, to work directly against ignorance, superstition, prejudice, commercialism, and quackery. The special problem, faced by many members, is to promote the interests of the individual practitioner in his own community in a way that is simple, efficient, economical, and ethical.

THE METHOD OF SOLUTION

It is proposed to solve both problems by publishing a monthly magazine dealing in a vivid, popular way with aspects of veterinary medicine of interest to the general public: the direct relationship between the human and animal worlds, the training and work of the present-day veterinarian, the proper care of pets, the conservation of wild life, etc. Evidence that such a magazine would command an appreciative audience is given by the rapidly increasing amount of space that is given to animal subjects by leading newspapers and national magazines. The proposed AVMA magazine would satisfy this existing inter-

est with authoritative articles by competent writers.

It is suggested that this magazine would solve the broad problem of public education by telling true facts about veterinary medicine to a selected influential audience throughout America, and by providing a source of articles for reprinting in the national press.

It would solve the special problem of ethical promotion for individual members of the national and local associations because, by the proposed plan, its circulation would be restricted to subscriptions purchased by members or local associations. That is, any member could arrange to send the magazine, with his card and compliments, to influential persons in his community. It is believed, on the basis of tested experiences in other fields, that this method of circulation would develop active goodwill for the practitioner. It would act as a promotional influence without employing commercial promotional pressure.

COST

It is estimated that such a magazine could be made self-supporting in terms of income derived from paid advertising approved by the Association and from annual subscriptions purchased by members for local circulation. The price per subscription would be sufficiently low to permit any interested member to purchase 20 or more subscriptions—the economic minimum—for his private list.

OPERATION

The magazine would be operated through the executive office, where all production and distribution details would be managed. Participating members would be required only to furnish subscription lists and professional cards. Mailing would be handled from the central office. In this way, members would be relieved of all detail work in connection with the magazine.

ADVANTAGES

a) The organ provides controlled publicity contact between the Association and

the general public—an important factor in an era of uncontrolled propaganda.

b) Although present plans provide for a modest and conservative beginning, the active support of members and the stimulus of a responsive public could lead to the development of a strong publication that would substantially advance public appreciation of the rôle of veterinary medicine.

c) It provides a new solution to the difficult problem of promoting the practice of individual members—a solution that is both ethical and constructive.

d) While offering special advantages to participating members that will justify their individual support, it will contribute to the welfare of all members by advancing the common cause.

The foregoing paragraphs are a broad summary of a proposal which has been considered in detail by the Committee on Public Relations and the Executive Board. Comments or questions concerning this proposal should be submitted promptly for consideration.

Foreign Exchanges

EUROPEAN exchanges have either ceased to arrive or arrive late and reduced in size. Our abstracts from foreign journals are, therefore, manifestly curtailed. Being mindful of the extent to which our foreign colleagues enrich the sum of veterinary knowledge month after month, we look upon the situation with deep regret. We, however, continue to mail the JOURNAL exchanges to all European countries, hopeful that they will reach their destination.

In these somber days of distress, unrest and tragedy, our most sympathetic solicitations go out to our good friends abroad who are mobilized in defense of their respective countries. From the professional point of view, there is satisfaction found in the reports that the veterinarians of all countries are intensifying their efforts to conserve the much-needed domestic animals of the armies and civil populations.

WITH THE EDITORS

THIS IS the Convention Number, an issue giving a fairly complete account of the coming Washington session in regard to literary contributions, entertainment, educational and technical exhibits, clinics and demonstrations, and the subsidiary societies which now convene concurrently with the national. The issue contains a directory of the House of Representatives—delegates and alternates—and a picture of the delegates chosen since the March issue, when we printed pictures of the members of the House as it was composed on that date.

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The lethal effect of entozon on *Streptococcus agalactiae* within the udder is described by O. W. Schalm of the University of California. The article reviews the efforts that were made in recent years to destroy the flora of bovine mastitis by means of intramammary injections of acridine dyes. According to Steck and others, antiseptic irrigations can be recommended as an excellent aid in ridding dairy herds of chronic mastitis. Schalm's work shows that this line of treatment has a place in bovine medicine. Entozon and the method of application are described.

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H. W. Schoening and Robert Graham contribute their views on the subject of reactions following the injection of equine encephalomyelitis vaccine (chick embryo). Their respective articles appear on pages 38 and 39 of this issue. Attention also is called to an abstract (p. 40) of an article by Dr. Schoening and coworkers in which it is shown that the regular encephalomyelitis vaccine (chick embryo) administered intradermally produces a satisfactory immunity. The dose is only one tenth of that used intramuscularly or subcutaneously.

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Worthy of more than casual notice is the short report of Fernando Camargo, veteri-

nary director of the Animal Health Bureau, Biotechnic Institute of Mexico, pointing out the similarity of encephalitis of horses and cattle. Though immunologically distinct, one virus seems to be responsible for both the equine and bovine manifestations of the disease. The Association appreciates this report from its confrère in Mexico.

» » »

An Ohio member doesn't like "Animals That Make the News" on the ground that the space could be put to better use. The reply was that the column is intended primarily to "dilute" the rear advertising pages with material worth while. Editors understand that. "Worth while" because the column is all zootechnics of domestic animals and wild life, a branch of veterinary medicine laymen are apt to understand better than we who profess to know so much about animals. The motto of the editor of that column is "You can't know too much about animals." The animal doctor who leaves all to the naturalist is often caught empty headed through insatiable thirst for recipes and specialized medical sciences.

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The raising of minks on an ever-increasing scale brings another stranger into the field of veterinary medicine, which, along with foxes, coons, skunks, chinchillas and others, will sooner or later become a subject of intensive study in regard to its ailments. The article by Pinkerton in the March issue on mink distemper is a classical study of the disease showing its clinical similarity to the canine infection and the total lack of cross immunity. The article emphasizes the importance of inclusion bodies in epithelial tissue as a means of diagnosis, as was also emphasized by Green in the diagnosis of distemper in dogs. A vaccine prepared from a mink strain of virus was effective in protecting minks against distemper.

CURRENT LITERATURE

ABSTRACTS

Alaskan Dogs in War

The North American sledge dog is given a high rating as a military animal. Four hundred of them were imported by France during the World War from Labrador and western Canada. They were easily acclimatized and trained, reproduced well, thrived on the prescribed diet of meat and vegetables, and did not suffer from summer heat, although kept at an altitude of but 1,500 meters.

They performed a limited service in transporting munitions and food, especially in the Vosges Mountains during the months of abundant snow and severe weather of 1916-17. The recent maneuvers of Brianconnais (1938) showed that dogs can render a service in transportation in mountainous terrain.

Germany has developed a war-dog service that is highly centralized. It is maintained in times of peace through governmental coöperation with dog societies devoted to the raising of dogs available for the military service when needed. [C. Bressou. *Les Chiens d'Alaska Pendant la Guerre. Recueil de Médecine Vétérinaire*, cxv, December 1939, p. 892. Abst., *La Terre et la Vie*, March-April 1939.]

Occupational Swine Erysipelas

While inspecting carcasses of swine showing congestive lesions in an abattoir of Paris the inspector accidentally infected a slight excoriation at the end of the middle finger. On the following day the lesion was red and hot. Several days later, the entire finger was edematous, hot and painful. The lymphatic vessels on the dorsal face of the hand were engorged. There was a slight adenitis at the wrist and the axillary lymph node was swollen and sensitive. The physician consulted thought the

trouble was but a simple lymphangitis and prescribed the usual remedies (hot baths and an emollient ointment). The edema left the original site and gained the base of the adjacent fingers. On examination of the hand, the directors of the service (Chretien and Pétard), fearing the trouble was swine erysipelas, took the patient to the Pasteur Institute, where a tentative diagnosis of that disease was made by Truche and Staub, who prescribed stovasal internally and injections of anti-swine-erysipelas serum. The swelling had spread over both the dorsal and palmar faces of the hand when (on the eleventh day) the serum treatment was begun. The serum checked the course of the infection in two days. The swelling completely disappeared and the axillary adenitis subsided.

Nine days after the serum was injected, a violent urticaria with some fever developed. But this allergic reaction to the heterologous (horse) serum disappeared in several days. [M. Mariette. *Observation d'un Case de Rouget du Porc Chez l'Homme. Bulletin de l'Académie Vétérinaire de France*, xiii (Jan.-Feb. 1940), pp. 21-22.]

The Use of Thiamin Hydrochloride in Treating Fright Disease in Dogs

Fright disease, often called running fits or canine hysteria, was first reported [as a definite entity] during the World War. The symptoms usually exhibited are anorexia, loss of weight, excitement, photophobia, epileptiform fits, posterior paralysis, convulsive seizures, and neuroses.

At the present time, it is very prevalent in the United States and most small animal practitioners see many cases each year. The control and prevention of fright disease, therefore, would be a major contribution to canine medicine. Patton recently investi-

gated the disease and conducted various experimental tests. He believes that most cases of so-called fright disease in dogs are caused by a vitamin B₁ deficiency. He carried out a series of experiments in which he apparently produced the disease artificially with a vitamin-B₁-deficient diet and then proceeded to effect a cure with daily injections of thiamin hydrochloride.

This disease again emphasizes the value of a well-balanced diet in canine nutrition. Also, if clinical experience confirms Patton's investigations, we have practically a specific in the treatment of fright disease in the drug thiamin hydrochloride. This is the pure salt of vitamin B₁ and the dosage given is usually 500 international units daily until the patient becomes normal. Thiamin hydrochloride is given subcutaneously.

The prevention of the disease is, of course, of paramount importance and this, according to Patton, consists in feeding a well-balanced diet adequate in vitamin content, especially vitamin B₁. The general health of the animal also should be maintained at a high level through proper hygienic measures. It might be mentioned that in the past few months Patton's conclusions as to the etiology of fright disease have been questioned by several investigators and it appears that there may develop some disagreement regarding the cause of the disease. [Capt. W. F. Collins, V. C., U. S. A. *Veterinary Corps Bulletin*, April 1940.]

Internal Secretions in Milk Fever

A ketogenic and also a anti-ketogenic factor were found in the blood of cows suffering with milk fever. The ketogenic factor is freely diffusible and is found in the protein fraction of the blood serum. Twenty-four hours after parturition these factors are not found in any significantly increased amount.

When the blood serum obtained from cows with milk fever is injected subcutaneously into white rats, the blood-sugar level is increased. This hyperglycemic action is limited to the protein fraction of the blood serum. The hyperglycemic factor is diffu-

sible through rather permeable ultrafilters but not those of low diffusibility. Blood serum or blood-serum ultrafiltrate obtained from normal cows 24 hours after parturition had no influence on the blood-sugar level of rats. However, both types of blood serum lowered the glycogen content of the livers of the test rats.

It was noted in a previous experiment that the glycogenolytic action of 3 cc. of blood serum of cows with milk fever exceeded the effect of the same dose of blood serum of normal cows 24 hours after parturition. When 12 cc. was used, the results were just the opposite.

This entire investigation more or less explains the two biochemical symptoms of milk fever: the variations in the blood sugar and ketones in the blood of cows suffering with milk fever. Moreover, the results obtained are in accordance with and support the author's hypothesis concerning the action of the anterior pituitary gland in the etiology and pathogenesis of milk fever. [L. Seekles. *The Internal Secretions in Parturient Paresis in the Cow*. *Tijdschrift Voor Diergeneeskunde* (March 1, 1940), p. 240.]

Tuberculin Reactions in Cattle Infected with the Human Type of the Tubercle Bacillus

Healthy cattle exposed to infection from persons with open pulmonary tuberculosis may readily become sensitized to the intradermal test with bovine tuberculin. As a rule, the reactions are small and, in most instances, the sensitivity is only temporary. When a subcutaneous test is applied to these animals, it is found that only a few react. If the source of the infection is removed, the sensitivity seems to decrease and the animals will no longer react. Only exceptionally are lesions demonstrable in animals that react to the tuberculin test after exposure to human cases. The few lesions that have been described are usually limited to the lymph nodes of the respiratory tract. In no instance has it been possible to demonstrate human tubercle bacilli in the milk of cows infected spon-

taneously by caretakers affected with open pulmonary tuberculosis.

Several case reports are given of herds that previously had been tuberculosis free but in which atypical reactions to bovine tuberculin appeared. Retests of these reactors with avian and bovine tuberculin gave only slight reactions and the subcutaneous test with bovine tuberculin ruled out the presence of bovine tubercle bacillus infection. It was found that the caretakers had open pulmonary tuberculosis and, when they were removed, there were no more reactors among the cows. [*F. Woldike Nielsen and N. Plum. Tuberculin Reactions in Cattle Due to Infection with the Human Type of the Tubercle Bacillus. Skandinavisk Veterinär-Tidskrift, xxx (1940), pp. 245-274.*]

Transmission of Fowl Paralysis

Durant and McDougale were able to transmit fowl paralysis by transfusing blood obtained from chicks hatched from eggs of hens exhibiting clinical symptoms of the disease. In this experiment, 17.1 per cent developed the disease. In the control group only 3.55 per cent became infected. The results also indicated that there were three periods in the age of the donors during which the blood transmitted the disease more readily. The ages were as follows: 1) 20 to 30 days, 2) 50 to 60 days, and 3) 110 to 120 days. [*Missouri Agr. Exp. Sta. Research Bulletin No. 304.*]

The Thyroid and Milk Fever

In researches on the nature of typical and atypical milk fever, the author encountered two ewes, one affected with tetany and the other with typical milk fever. In both cases the thyroid showed interesting peculiarities. In the center of each lobe there was a cavity the size of a date kernel filled with a creamy, homogenous, straw-colored pus, comparable with cheese "that runs." It was neither pus nor colloidal substance. Microscopically, the paste showed that it was constituted uniquely of epithelial cells in the course of degeneration. Most of the cells were large and flat with borders rolled up or pleated and rec-

tangular or polygonal in shape. The central nucleus of the kernel was small, ovoid and violet in color. Its protoplasm was slightly granular and of light rose color.

The cavity was walled off from the parenchyma and the latter showed no visible lesions, except slight melanotic infiltration equal on both sides, and arranged in star-like radiations. [*Dr. Montaux. Particularités Observées sur les Thyroïdes de Mouton. Recueil de Médecine Vétérinaire, cxvi (Jan. 1940), p. 17.*]

Epinephrine, a Magic Drug

It has been observed that mares usually foal during the night. Although apparently ready to foal in the daytime, they often appear to delay the act until after dark. One of the author's clients, objecting to the repeated "night watches" whenever a mare was due, darkened the stable in the daytime and left the mares undisturbed. The result was that many mares foaled during the day.

It also is known that babies usually are born later during the summer months. This has been found to be especially true in cases where expectant mothers have been taking sun baths during the later stages of pregnancy. This phenomenon can be explained on the premise that epinephrine, the labor-producing hormone, is sensitive to ultraviolet light and is thus destroyed by sunlight. This also explains why most babies and animals are born at night. The daylight has destroyed much of the epinephrine, which must be regenerated in the dark of the night to reach a level in the blood stream sufficiently high to induce labor.

Another "magic" quality of epinephrine is its hemostatic property. This was utilized by butchers many years before epinephrine was discovered. Whenever a butcher would cut himself, he would cut through a fresh suprarenal gland and press this on the wound. The blood stopped flowing immediately. These people used epinephrine therapeutically before it was discovered. [*Stedefeder. Adrenalin, ein Wundermittel. Berliner und Muenchener Tieraerztliche Wochenschrift, iii (Dec. 29, 1939), pp. 750-751.*]

BOOK NOTICES

Chemistry and Medicine

Once but a fringe of the medical curriculum, chemistry now stands at the very top, uncontested. Although the philosophy and science expounded by Paracelsus (1493-1541) were elementary, they were none the less the starting point of a medical era leading, laboriously, to the brilliant discoveries in biological chemistry of the past three decades, which, needless to emphasize, have changed the concepts of physiopathology and the tactics of therapeutics.

The book, *Chemistry and Medicine*, documents the trend of chemistry as it applies to the progress of medicine. It contains the group of scientific papers presented by celebrated authorities at the 50th anniversary of the founding of the Medical School of the University of Minnesota which, in recent years, has contributed richly to the sum of useful knowledge in human and veterinary medicine.

Part I contains three articles: a) Some Aspects of Colloidal Chemistry of Membranes, by Herbert Freundlich; b) Performance of Cosmic Work in Living Systems, by Maurice Visscher; c) Some Reactions by Which Solutes May Be Differentiated, by John F. Peters.

Part II comprises three papers on metabolism; a) Organic Chemistry in the Pursuit of Vitamin Research, by Lee Irwin Smith; b) The Necessity of Fat in the Diet, by George O. Burr; c) Herparin and Thrombosis, by Charles H. Best.

The article on vitamins discussing the chemist's approach to the "biological catalysts" (vitamins, hormones, enzymes) contains the known facts that are now regarded as indispensable in rational medical practice. A table on "Discovery of Vitamins" giving the dates of discovery, isolation, synthesis, and the designation, of the eleven known vitamins (A to K₂) will save a lot of search when these facts are desired. In explaining the "pursuit" of a vitamin by chemists, vitamin E researches are taken

as an example. Thus the author takes the reader through 35 pages of material, important to all concerned (chemist, biologist, physician, veterinarian), which iron out a great deal of the dispute over the rôle of this factor in the biological processes of higher life, and its use in the practice of medicine.

Part III, touching upon the modern aspect of immunity and chemotherapy, contains four articles of outstanding interest in our branch of medicine: a) Recent Chemical Trends in the Study of Immunity, by Micheal Heidelberger; b) The Biology of Animal Viruses, by R. G. Green; c) The Mode of Action of Sulfanilamide and Its Derivatives, by Perrin H. Long; d) Chemistry of Urinary Antisepsis, by Henry F. Helmholz.

The article on viruses by R. G. Green is a 27-page summation of the nature of viruses and virus infections in which the brilliant work of this bacteriologist on fox encephalitis and canine and fox distemper is described. Obviously, the researches on these virus diseases carried out among hundreds of thousands of animals (foxes, minks, dogs *et al*) in Wisconsin and Minnesota led to the decisions which now govern the study of filtrable viruses. The immensity, persistence and long duration of these investigations and the important factors they have revealed, makes the world of science indebted to the fur-farming industry. The demonstration of specific affinity of certain viruses to certain cellular systems is ground work of the first rank in the study of ultra-microbial diseases. This fact alone is apt to completely revolutionize the strategy of attack.

Perrin H. Long of Johns Hopkins University, pioneer investigator of the action of sulfanilamide, presents a long article on the subject that leads but to the conclusion that the *modus operandi* remains unknown. Quoting: "Sulfanilamide and sulfapyridine

act as bacteriostatic and, under certain conditions, as bactericidal agents against susceptible bacteria. They also seem to have the power of inactivating certain bacterial toxins. . . . The mechanism remains unknown despite several attempts to explain it."

Part IV contains four essays on nervous control of the organism, delving deeply into functional troubles of the nervous system that are difficult to connect with any entity known in animal medicine. The biological mechanism of convulsive reactivity involving the hypo- and hyper-glycemias, parathyroidisms, thyroidisms, insulinisms, mineral deficiencies, etc., is not well enough understood to associate its particular operations with the definite nervous upsets encountered in clinical work. The importance of it, however, is not questioned. Functional nervous pathology in animals is admittedly a wide, unexplored field. As one of these essayists (Gasser) declares, complete understanding of nerve mechanics is the goal, and knowledge relating to the subject is increasing.

Chemistry and Medicine is not the ultra-scientific treatise its title may seem to indicate. It is a book everyone desiring to keep up to date should read and study. If it contains chapters seemingly unrelated to every day work, it has other chapters revealing facts of the up-to-the-minute type none who practices medicine should miss. [*Chemistry and Medicine. Edited by Maurice B. Visscher, professor of physiology, University of Minnesota. The University of Minnesota Press. 296 pages. 1940. Price, \$4.50.*]

Proceedings of the Forty-Third Annual Meeting of the United States Live Stock Sanitary Association

This annual visitor comes in new raiment for 1939-1940 by a new editor, Secretary Mark Welsh, who has given the profession another excellent book in reporting a year's work in livestock sanitary science in the form of articles, lectures, committee reports and open discussions comprising the 1939 proceedings of that growing national association. The United States Live Stock

Sanitary Association is not just another society devoted to diseases of domestic animals. It is composed largely of officials who see that livestock sanitary laws and regulations are enforced and new ones enacted. It is the "meeting of minds" working upon the nation's greatest enterprise—the raising of animals—and the printed report in question is a true picture of what these minds accomplish for their respective states and for the nation as a whole. Under the presidency of J. L. Axby, state veterinarian of Indiana, the Association has taken another step forward. The proof is the quality of the material, the high standing of the reporters, and last but not least, the excellent typography and editing of the official report. The address of welcome to Illinois by Dean Rusk of the College of Agriculture, University of Illinois, the response by Chief Mohler of the Bureau of Animal Industry, United States Department of Agriculture, the addresses of Professor Létard of Alfort (France) and of Congressman Gillie, and the allocation of President Axby write historic records into the affairs of the USLSA. To read them is to learn what is occurring in the immense field of livestock sanitation and veterinary preventive medicine. Beyond these are classical reports on Bang's disease, Texas fever, bovine and avian tuberculosis, encephalomyelitis, rabies, swine-disease problems, poultry medicine, miscellaneous transmissible diseases, milk and meat hygiene, such general subjects as the fundamentals of animal-disease control, interstate shipping of live stock, and others.

Through the text one sees such prominent names as Wight, Short, Hendricks, Eichhorn, Thaller, Corwin, Feldman, Faulder, Campbell (D. M.), Schoening, Giltner, Shahan, Lacroix, Simmons, Winton, Beaudette, Carpenter (Cliff D.), Doyle, Bryant, Koen, Schalk, Kernkamp, Lytle, Hale (M. R.), Jungherr, Durant, Records, Hendershott, Hurt (L. M.), Healy (J. S.), Cotton (C. E.), Curry, Butler (W. J.), Smith (R. M.), Westmorland, Duckworth, Cameron (A. E.), Schwartz (Benj.), Simms, Port, McAdory, and others.

The type for 4" columns and for headlines and subheads is well chosen, the

paper is good and the binding well done. Here is a book that is needed by those interested in the science and practice of veterinary medicine in or out of the official roster. [*Proceedings of the Forty-Third Annual Meeting of the United States Live Stock Sanitary Association. Edited by Secretary-Treasurer Mark Welsh. Reese Press, Baltimore. 311 pages. Price, \$2.00.*]

Rule Book of the American Horse Show Association

The 1940 edition of this book contains the basic laws of the American Horse Show Association, the directorate, the list of member shows and authorized judges, the classification and the dates of the shows to be held during the year, and full details of the rules governing membership, dues, entries, appointments, judging and awards, together with a list of winners of the Association's medal for 1939.

The book will be found indispensable to those casually concerned in the showing of horses at licensed shows and is, of course, the official guide of those engaged in horse-show affairs and management. The authors point out particularly what part of the book should be studied by exhibitor, judge, regional committee, show secretary, and children who compete.

"The absence of a rule," says the editor, "entails hasty and sometimes unwise decisions," hence the publication of "the most complete compendium of information" on the subject ever compiled. [*The American Horse Show Association Rule Book, with a foreword by Adrian Van Sinderen. The American Horse Show Association, 90 Broad St., New York, 1940.*]

The Milking Goat

The Milking Goat is a compilation briefing a few facts about goats and goat's milk. It is not a literary gem and, from the scientific point of view, it is a misfortune to its sponsor, *The Goat World* of Vincennes, Ind., which is one of our most welcome exchanges. How to start with goats and goat-milk dairying, selection, care, breed-

ing, etc., appears to be based upon the author's experiences gathered among the goats around Hartland, Wis., plus free reference to the orthodox literature on goats. With the mistakes out, it would be a useful primer for the beginner. The paragraphs on diseases, especially on Malta fever, should have been left out. While the author regrets that he doesn't like to "laugh off" the opinions of Evans, Huddleson, Craig, *et al*, he is convinced (without telling why) that there is not "much relationship between Malta fever in goats and abortion disease in cows either between themselves or in human pathology."

It would take a book of almost equal size to point out all of the infelicities in spelling, typography, capitalization, punctuation and technicalities. The dose of Epsom salt (spelled Epsom salts in one place and epsom salts in another) for a goat is a teaspoonful. Malta Fever and Malta fever appear in the same paragraph. In one place it's Abortion Disease and in another Abortion disease.

Thirty or more years ago, the author would have been called the well-known writer of many small books on various subjects which added nothing in particular to the sum of veterinary knowledge. An exception is *The Itinerant Horse Doctor*, a book telling a great deal about quacks and quackery in the Southwest, which historians who want the truth about the early days can still use to advantage. [*The Milking Goat. By M. R. Steffens, V. S., M. D. C. Will L. Tewalt, Vincennes, Ind. Paper bound, 70 pages.*]

An important point (in laryngotracheitis) is the fact that some birds which recover continue to carry the virus, presumably throughout life. The carrier is therefore the reservoir for the annual outbreak.—*Beaudette in Poultry Practice.*

Quackery is still an obstacle to ethical veterinarians. There are about 50,000 practitioners who claim to know something about the treatment of animals. Forty thousand of them are peddlers of pills or graduates of two-week chicken schools.—*From Vocational Trends, March 1939.*

THE NEWS

AVMA Activities

Twelfth International Veterinary Congress Prize Winner Selected

The committee consisting of President Way, H. W. Jakeman, John R. Mohler, R. A. Kelser and I. E. Newsom have selected the recipient of the Twelfth International Veterinary Congress prize, given annually by the AVMA to a veterinarian who has made an outstanding contribution to veterinary medicine. His name will be announced and the prize given at the opening session of the Washington meeting.

Fifth District Executive Board Election in Progress

The balloting for the member of the Executive Board resulted in the nomination of W. L. Boyd, H. C. H. Kernkamp, A. H. Quin, H. B. Treman and F. M. Wilson. These five men received the largest number of votes and their names were placed on the election ballot which was mailed on June 1 to all members residing in Minnesota and Iowa. The results of this election will be announced on August 1 and the successful candidate will take office immediately following the Washington session.

Ingmand Attends Montana Meeting

Among the stops made by Assistant Executive Secretary Ingmand on his journey to the Pacific Coast in behalf of the national association was the meeting of the Montana Veterinary Medical Association at Bozeman, June 28-29. From Bozeman he traveled to Denver, where he investigated accommodations for the 1942 meeting.

President Way Warns Against Man Posing as Brother of Dr. Gillmann

Word has been received from President Way to the effect that a man who represents himself as George Gillmann is calling upon members of the profession and purporting to be a brother of John H. Gillmann of Memphis, Tenn. He is urgently soliciting funds in order that he may "return to Memphis." With this appeal the imposter succeeded in obtaining \$30 from one of the Association's eastern members. The member happened to mention the incident to Dr. Way, who became suspicious and wrote to Dr. Gillmann to confirm the man's identity. Gillmann replied that he does not have a brother named George.

Since this individual may attempt to victim-

ize other members of the profession, JOURNAL readers are requested to report promptly to local authorities and to the executive office of the Association any personal contact with him or information that will be helpful in bringing about his arrest.

Election of Executive Board Member for District III

District III comprises Illinois, Indiana and Wisconsin. The district is now represented on the Executive Board by Herbert Lothe, Waukesha, Wis., who was appointed to the office by President Bergman (1939) to replace the elected member (Merillat), who resigned on being appointed executive secretary.

Shortly after July 1, the members of the Association in the states above named will receive the nominating ballot. Sixty days later a ballot containing the names of the five candidates receiving the largest number of votes will be mailed to complete the election. The successful candidate, according to customs of the past, will take office after the Washington session.

The time newly elected members of the Executive Board take office is a matter that should be clarified in the revised by-laws. The logical plan would be to have the tenure correspond to the fiscal year—January to January—since an important meeting of the Board is held in December. At the present there seems nothing more to do than to follow the habits of the past, and arbitrarily terminate tenures following the annual meeting.

The 1941 Meeting

An informal meeting of Indiana members to lay plans for the annual session of the Association at Indianapolis in 1941 was held at Tri-Lakes, near Columbia City, Ind., June 23. The meeting was held in connection with the annual outing of the Northeastern Indiana association at the summer cottage and grounds of G. L. Clark of Columbia City. State Veterinarian Axby, Indiana delegate to the House of Representatives, Resident Secretary Schoenlaub, President Baker and Vice-President Botkin of the state association, D. M. Campbell of the Committee on Public Relations and Executive Secretary Merillat of the national association, and J. L. Kixmiller of Allied Laboratories, Inc., participated in this preliminary

APPLICATIONS

Rules Concerning Applications for Membership (Quoted from the by-laws):

Application for membership shall be made upon a blank furnished by the Association, in the handwriting of the applicant, and must be endorsed by two members of the Association in good standing, one of whom must be a resident of the state, province or territory in which the applicant resides. Application must be accompanied by the membership fee of \$5.00 and dues pro rata for the balance of the fiscal year current, as stated on the application blank. Application must be filed with the secretary and be examined by him for correctness and completeness as far as available information will allow. After such approval by the secretary, the latter will cause to be published in the official JOURNAL, as soon thereafter as possible, said application with name and address of applicant, college and year of graduation, and names of vouchers. If no objections shall be filed with the secretary, as against the applicant's being admitted to membership in the Association, his name shall again be listed in the next issue of the JOURNAL, and if no objections shall have been filed within 30 days after the second publication of the name of the applicant, he shall automatically become a member.

[Among the following list of 207 applicants, 144 are June 1940 graduates. The remaining 63 were graduated prior to 1940.]

First Listing

ALBERDING, MILTON STEPHEN

Oriskany Falls, N. Y.

D.V.M., Cornell University, 1940. Vouchers:
A. G. Danks and W. A. Hagan.

ALFSON, GEORGE ROBERT

311 College Ave., Ithaca, N. Y.

D.V.M., Cornell University, 1940. Vouchers:
W. A. Hagan and A. G. Danks.

meeting. The interest shown in the coming convention indicates that Indiana veterinarians are keenly aware of the responsibility undertaken. The largest meeting in the Association's history was one of the declared objectives.

Guard Will Represent AVMA at Kentucky State Meeting

W. F. Guard, professor of veterinary surgery, The Ohio State University, will attend the Kentucky state association meeting as a guest speaker for the AVMA, July 10-12 at Louisville. His subject will be equine surgery.

ALLEN, THEODORE

735 Walton Ave., Bronx, N. Y.

D.V.M., Cornell University, 1940.

B.S., College of the City of New York, 1936.

Vouchers: W. A. Hagan and Donald W. Baker.

AMBERY, PAUL

129 E. Grand River, East Lansing, Mich.

D.V.M., Michigan State College, 1940.

Vouchers: C. F. Clark and B. J. Killham.

ANDERSON, JAMES GORDON

Post Road, Greens Farms, Conn.

B.V.Sc., Ontario Veterinary College, 1936.

Vouchers: G. E. Corwin and R. L. Smith.

ANMUTH, MORTON

1433 N. 7th St., Philadelphia, Pa.

V.M.D., University of Pennsylvania, 1940.

Vouchers: A. Henry Craige, Jr., and R. S. Amadon.

BABICH, PETER JOSEPH

R. F. D. No. 1, Red Hook, N. Y.

D.V.M., Michigan State College, 1940.

Vouchers: C. F. Clark and B. J. Killham.

BADGER, MAX

Bloomington, Ohio.

D.V.M., Ohio State University, 1940.

Vouchers: W. F. Guard and J. H. Knapp.

BAKER, JAMES A.

129 College Ave., Ithaca, N. Y.

D.V.M., Cornell University, 1940; B.S., M.S.,

Louisiana State University; Ph.D., Cornell

University. Vouchers: W. A. Hagan and
Donald W. Baker.

BALTHASER, BENJAMIN FRANKLIN

2810 S. Federal Hwy., Fort Lauderdale, Fla.

D.V.M., Alabama Polytechnic Institute, 1934.

Vouchers: C. A. Palmer and M. W. Emmel.

BARTOL, FRANK HENRY

412 W. Hemlock St., Chisholm, Minn.

D.V.M., Michigan State College, 1940. Vouch-

ers: C. F. Clark and B. J. Killham.

BATSON, NEAL CALVIN

1296 Fairview Rd., Atlanta, Ga.

D.V.M., Alabama Polytechnic Institute, 1940.

Vouchers: R. L. Mundhenk and E. S. Winters.

BATT, HENRY THOMAS

931 E. State St., Ithaca, N. Y.

V.S., B.V.Sc., Ontario Veterinary College,

1933; M.S., M.V.Sc., L'école Nationale Vét-

érinaire d'Alfort, France; Ph.D., Cornell

University, 1940. Vouchers: C. E. Hayden

and W. A. Hagan.

BELL, FRANK N.

1822 D St., Pullman, Wash.

D.V.M., State College of Washington, 1930;

B.S., M.S., University of Wisconsin, 1932.

Vouchers: E. E. Wegner and J. E. McCoy.

- BENTHAM, WILFRED SYLVESTER**
244 E. 14th St., San Leandro, Calif.
D.V.M., Colorado State College, 1933. Vouchers: J. K. Perry and Eugene B. Ingmand.
- BERGERSON, JOHN RUSSELL**
R.F.D. No. 1, Perry, N. Y.
D.V.M., Cornell University, 1940. Vouchers: W. A. Hagan and Donald W. Baker.
- BERLINER, BERNARD JACK**
4 Margot Place, Great Neck, L. I., N. Y.
D.V.M., Michigan State College, 1940. Vouchers: C. F. Clark and B. J. Killham.
- BILLINGSLEY, JOHN THOMAS**
107 Water St., Bristol, Va.
D.V.M., Alabama Polytechnic Institute, 1940. Vouchers: R. L. Mundhenk and J. E. Greene.
- BISCHER, BENJAMIN**
1652 64th St., Brooklyn, N. Y.
D.V.M., Michigan State College, 1940. Vouchers: C. F. Clark and B. J. Killham.
- BORCHMAN, HELEN MARIE**
48 Nassau Rd., Great Neck, L. I., N. Y.
D.V.M., Cornell University, 1940. Vouchers: W. A. Hagan and Donald W. Baker.
- BOYD, JOHN C.**
P. O. Box 354, Kalispell, Mont.
D.V.S., Kansas City Veterinary College, 1908. Vouchers: W. J. Butler and H. F. Wilkins.
- BOYER, CLYDE IRVIN, JR.**
408 S. 3rd St., Colwyn, Pa.
V.M.D., University of Pennsylvania, 1940. Vouchers: W. Graham Love and A. Henry Craige, Jr.
- BOYNTON, JAMES WEBSTER**
40 Cottage Place, Roosevelt, N. Y.
D.V.M., Cornell University, 1940. Vouchers: W. A. Hagan and Donald E. Baker.
- BRANDEHOFF, ALBERT J.**
821 E. Third, Delphos, Ohio.
D.V.M., Ohio State University, 1940. Vouchers: W. F. Guard and J. H. Knapp.
- BRATT, H. MARVIN**
706 S. 24th St., Terre Haute, Ind.
D.V.M., Michigan State College, 1940. Vouchers: C. F. Clark and B. J. Killham.
- BRIDENSTINE, JAMES ROY, JR.**
West Jefferson, Ohio.
D.V.M., Ohio State University, 1940. Vouchers: W. F. Guard and J. H. Knapp.
- BRITTIN, EMMETT E.**
Sherman, Ill.
D.V.M., Michigan State College, 1940. Vouchers: C. F. Clark and B. J. Killham.
- BROWN, ALLAN K.**
Capitola, Calif.
D.V.M., State College of Washington, 1928. Vouchers: Chas. J. Parshall and W. E. Brandner.
- BRYAN, ARTHUR H.**
4201 Walther Blvd., Baltimore, Md.
V.M.D., University of Pennsylvania, 1918; M.A., University of Maryland, 1934; B.S., State College of Washington, 1919. Vouchers: A. L. Brueckner and L. J. Poelma.
- BURNS, HENRY CHARLES**
c/o Bahamas Humane Society, Nassau, N.P., Bahamas.
D.V.M., Michigan State College, 1940. Vouchers: C. F. Clark and B. J. Killham.
- BUSSEY, ANTON**
519 Union Ave., N.E., Grand Rapids, Mich.
D.V.M., Michigan State College, 1940. Vouchers: C. F. Clark and B. J. Killham.
- CARLTON, CAREY**
Arcadia, Fla.
D.V.M., Alabama Polytechnic Institute, 1940. Vouchers: R. L. Mundhenk and I. S. McAdory.
- CARTER, HOMER DALE**
Russiaville, Ind.
D.V.M., Ohio State University, 1940. Vouchers: W. F. Guard and J. H. Knapp.
- CAVAZZI, JULIUS**
309 Cottage St., Rome, N. Y.
D.V.M., University of Bologna, Italy, 1902. Vouchers: William G. Keller and Don A. Boardman.
- CHAMPNEY, LYMAN H.**
Quarryville, Pa.
V.M.D., University of Pennsylvania, 1933. Vouchers: E. L. Stubbs and A. Henry Craige, Jr.
- CHEDESTER, LOUIS D.**
Cordell, Okla.
D.V.M., Texas A & M College, 1940. Vouchers: R. P. Marsteller and Eugene B. Ingmand.
- CHICKERING, EMILY GORDON**
Lancaster, Mass.
D.V.M., Cornell University, 1940. Vouchers: Donald W. Baker and W. A. Hagan.
- CHURCH, RAYMOND BURTON**
Boston Post Road, Westport, Conn.
V.M.D., University of Pennsylvania, 1940; B.A., Wesleyan University, 1936. Vouchers: G. A. Dick and A. Henry Craige, Jr.
- CLARK, DAVID S.**
R. No. 3, Adrian, Mich.
D.V.M., Michigan State College, 1940. Vouchers: C. F. Clark and B. J. Killham.
- COBB, CHARLES OTTO**
122 Maple Rd., Stow, Ohio.
D.V.M., Ohio State University, 1940. Vouchers: W. F. Guard and J. H. Knapp.
- COMBS, MARGARET ESTHER**
414 Stewart Ave., Ithaca, N. Y.
D.V.M., Cornell University, 1940. Vouchers: W. A. Hagan and Donald W. Baker.
- COMBS, PERRY THOMAS**
6 Clinton St., Batavia, N. Y.
D.V.M., New York State Veterinary College, 1932. Vouchers: Frederic F. Fehr and Eugene B. Ingmand.
- CONVERSE, CHARLES WILLIAM**
Franktown, Colo.
D.V.M., Colorado State College, 1912. Vouchers: Thos. E. Traylor and Jay H. Bouton.

- COOPER, VERN H.
Tipton, Ind.
D.V.M., Indiana Veterinary College, 1915.
Vouchers: G. O. Smith and J. C. Schoenlaub.
- CORBETT, ALAN CAMPBELL
Bacteriology Dept., Mich. State College, East Lansing, Mich.
D.V.M., Michigan State College, 1940. Vouchers: C. F. Clark and B. J. Killham.
- COX, WILLIAM L.
P. O. Box 764, Salisbury, N. Car.
D.V.M., Alabama Polytechnic Institute, 1937.
Vouchers: A. A. Husman and N. B. Tyler.
- CORONEL, ANACLETO B.
119 Fraternidad, Pandacan, Manila, P. I.
D.V.M., University of the Philippines, 1930.
Vouchers: W. A. Hagan and A. Zeissig.
- CULLOP, RICHARD HARVEY
Bruceville, Ind.
D.V.M., Ohio State University, 1940. Vouchers: W. F. Guard and J. H. Knapp.
- DAVISON, JAMES BRUCE
100 S. Elmwood Ave., Peoria, Ill.
D.V.M., Ohio State University, 1933. Vouchers: J. W. Hovorka and Eugene B. Ingmand.
- DE TRAY, DONALD E.
Napoleon, Ohio.
D.V.M., Ohio State University, 1940. Vouchers: W. F. Guard and J. H. Knapp.
- DIAMOND, LOUIS RALPH
465 Atkins Ave., Brooklyn, N. Y.
D.V.M., Alabama Polytechnic Institute, 1940.
Vouchers: R. L. Mundhenk and J. E. Greene.
- DONALDSON, JOSEPH MARVIN
Lee's Summit, Mo.
D.V.M., Michigan State College, 1940. Vouchers: C. F. Clark and B. J. Killham.
- DORMAN, JAMES J.
Waterville, Ohio.
D.V.M., Ohio State University, 1940. Vouchers: W. F. Guard and J. H. Knapp.
- DUCORSKY, DUKE HARRY
1820 Cornaga Ave., Far Rockaway, L. I., N. Y.
D.V.M., Ohio State University, 1940. Vouchers: W. F. Guard and J. H. Knapp.
- EDELSTEIN, SAMUEL
2520 N. 18th St., Philadelphia, Pa.
V.M.D., University of Pennsylvania, 1940.
Vouchers: Israel Live and A. Henry Craige, Jr.
- ENZIE, FRANK D.
2160 Olive Ave., Long Beach, Calif.
D.V.M., Ohio State University, 1940. Vouchers: W. F. Guard and J. H. Knapp.
- EVANS, EDGAR E.
4992 Tholozan Ave., St. Louis, Mo.
D.V.M., Ohio State University, 1940. Vouchers: W. F. Guard and J. H. Knapp.
- FAKE, LYNN BACON
84 S. Penataquit Ave., Bay Shore, L. I., N. Y.
V.M.D., University of Pennsylvania, 1939.
Vouchers: H. J. Milks and W. J. Gibbons.
- FAVATA, ANTHONY FREDRIC
521 Main St., Dunkirk, N. Y.
D.V.M., Cornell University, 1940. Vouchers: W. A. Hagan and Donald W. Baker.
- FETZER, WILLARD REED
North Liberty, Ind.
D.V.M., Michigan State College, 1940. Vouchers: C. F. Clark and B. J. Killham.
- FISK, ALEXANDER G.
711 Grant St., Denver, Colo.
D.V.S., San Francisco Veterinary College, 1906. Vouchers: Thos. E. Traylor and Jay H. Bouton.
- FLORIN, MARIA C.
424 E. Seneca St., Ithaca, N. Y.
D.V.M., University of Havana, 1939. Vouchers: W. A. Hagan and Donald W. Baker.
- FORMAN, CHARLES RICHARD
Box 399, Fort Lauderdale, Fla.
D.V.M., Iowa State College, 1940. Vouchers: J. H. Yarborough and C. H. Covault.
- FORTHOFER, CLINTON H.
Detroit Rd., Avon, Ohio.
D.V.M., Ohio State University, 1940. Vouchers: W. F. Guard and J. H. Knapp.
- FOX, MURL ALLEN
218 Bridge St., Aurora, Ind.
D.V.M., Ohio State University, 1940. Vouchers: W. F. Guard and J. H. Knapp.
- FUNDERBURG, DAVID
New Carlisle, Ohio.
D.V.M., Ohio State University, 1940. Vouchers: W. F. Guard and J. H. Knapp.
- GANGAROSA, RALPH LOUIS
61 Miller St., Rochester, N. Y.
D.V.M., Cornell University, 1940. Vouchers: H. C. Stephenson and W. S. Stone.
- GARDINER, HENRY C.
Anaconda, Mont.
M.D.C., Chicago Veterinary College, 1904;
B.S.A., Montana State College. Vouchers: W. J. Butler and E. M. Joneschild.
- GETTY, ROBERT
3028 Ahrens, Cincinnati, Ohio.
D.V.M., Ohio State University, 1940. Vouchers: W. F. Guard and J. H. Knapp.
- GIFFORD, REBECCA
65 William St., Pittsfield, Mass.
D.V.M., Cornell University, 1940. Vouchers: Donald W. Baker and W. A. Hagan.
- GLEISER, CHESTER ALEX
1221 Jackson St., Camden, N. J.
V.M.D., University of Pennsylvania, 1940.
Vouchers: A. Henry Craige, Jr., and Ryland Croshaw.
- GOBER, HAROLD STANLEY
235 E. 2nd St., Brooklyn, N. Y.
D.V.M., Alabama Polytechnic Institute, 1940.
Vouchers: R. L. Mundhenk and W. E. Cotton.
- GOBERT, CARL F. W.
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Bauman, William G., Barrington, Ill.

Beamer, Elliott V., Bennett, Iowa.

Beamer, Russell J., c/o Dr. J. S. Potter, Iowa City, Iowa.

Belinsky, Joseph, 12 Selkirk St., Pawtucket, R. I.

Bell, C. L., P.O. Box 191, Durham, N. Car.

Benson, M. R., 310 Bruce Ave., Grank Forks, N. Dak.

Betlach, E. R., 2204-A S. College Ave., Bryan, Texas.

- Blostein, Morris E., 819 S. Main St., Horseheads, N. Y.
 Blumenthal, Jacob Carl, Box 529, College Station, Texas.
 Boller, James W., 916 Ridgewood, Ames, Iowa.
 Boriskie, Paul P., 3333 12th St., Port Arthur, Texas.
 Born, W. R., Story City, Iowa.
 Bowen, M. E., 1044 Rigsby Ave., San Antonio, Texas.
 Boxwell, L. L., Springville, Iowa.
 Boyink, Gordon D., 1685 Dewey Ave., Rochester, N. Y.
 Brandt, Gerold, Garnavillo, Iowa.
 Brown, A. C., Hull, Iowa.
 Brown, Ellsworth S., 36 Chapin St., Canandaigua, N. Y.
 Brown, Homer B., Linden Ave., Broadmoor, Colorado Springs, Colo.
 Brumble, George H., 2937 Brook Road, Richmond, Va.
 Brutsman, Forrest E., Central City, Iowa.
 Bryson, Bernard G., 1618 Templeman St., Shreveport, La.
 Burns, Kenneth F., Milan, Ind.
 Bushnell, Jack K., 312 W. Laurel, Fort Collins, Colo.
 Byrd, Cecil E., Colorado City, Texas.
 Calhoun, Lois, Veterinary Anatomy Dept., Iowa State College, Ames, Iowa.
 Calhoun, Maurice Frederic, 1302 E. 13th St., Pueblo, Colo.
 Carneal, George, Iuka, Ill.
 Carpenter, Henry D., 208 S. College Ave., Bryan, Texas.
 Cedarleaf, Evar T., Jr., 776 E. Rose St., St. Paul, Minn.
 Champlin, John B., 3419 R. Street, Lincoln, Neb.
 Chapin, Glade V., Kasson, Minn.
 Cheney, Hamilton J., 1211 10th St., Great Bend, Kan.
 Chleboun, Paul E., Crete, Neb.
 Christensen, Merle E., 219 S. 4th St. W., Missoula, Mont.
 Christopherson, Elmer M., Fosston, Minn.
 Cissell, N. L., Blytheville, Ark.
 Clark, Franklin A., State Health Dept., 519 Dexter Ave., Montgomery, Ala.
 Clark, Frederick L., 21 Clinton St., Seneca Falls, N. Y.
 Cline, Franklin F., 703 California St., Pullman, Wash.
 Coble, J. Porter, Odessa, Mo.
 Cohan, Ernest, 901 E. Eighth Ave., Denver, Colo.
 Cohen, Stanley Edward, 682 Bushkill St., Easton, Pa.
 Conklin, Egbert S., 315 Albert St., East Lansing, Mich.
 Cook, J. E., R.R. 1, Virginia Park, Holland, Mich.
 Cook, Leon W., Dallas Center, Iowa.
 Coshow, Emery E., 714 McClure Bldg., Frankfort, Ky.
 Courtright, Edward L., Route 4, Box 756, Tucson, Ariz.
 Cox, Valton V., Box 1101, Lubbock, Texas.
 Crelin, Robert R., 1214 Corlies Ave., Neptune, N. J.
 Cripe, Owen H., 1215 Eye St., Marysville, Calif.
 Curtis, Homer C., Polo, Ill.
 Dahl, Tyrus V., Box 147, Pettus, Texas.
 Dahlquist, Ernest J., Fayette, Iowa.
 Davidson, J. L., 2226 Oakland Drive, Kalamazoo, Mich.
 Davis, Wendell E., Territorial Road, Benton Harbor, Mich.
 Dawson, Merle E., 307 S. Loomis St., Fort Collins, Colo.
 Deason, K. C., 301 S. Marshall St., Henderson, Texas.
 Diller, C. R., 7970 Santa Monica Blvd., Hollywood, Calif.
 Dixon, Floyd, 3322 Flower St., Huntington Park, Calif.
 Dreher, Wm. H., Oregon, Wis.
 Droge, J. M., Milan, Ind.
 Dubin, M. H., 1208 Maiden Lane, Pullman, Wash.
 Elliott, Ivan C., 627 Northwestern, Ames, Iowa.
 Elson, Berton E., 1447 52nd St., Brooklyn, N. Y.
 Emerson, Orin N., Eagle Grove, Iowa.
 Ensign, David Thomas, 331 Allen St., Hudson, N. Y.
 Everson, E. E., Rolfe, Iowa.
 Ezzell, A. F., 3346 E. 11th St., Tulsa, Okla.
 Findley, H. F., 213 N. 15th St., Birmingham, Ala.
 Fisher, Robert K., Ireton, Iowa.
 Fitte, John M., Box 124, Marlin, Texas.
 Foss, James O., Christine, N. Dak.
 Fraser, K. H., R.F.D. No. 2, Niles, Mich.
 Friderici, Kenneth S., R.R. No. 1, Schenectady, N. Y.
 Fuller, Stewart A., Box 23, College Station, Pullman, Wash.
 Ganz, I. H., 1056 Rutland Road, Brooklyn, N. Y.
 Gaskill, Harry E., Las Animas, Colo.
 Gidley, Joseph L., 1800 C. St., Pullman, Wash.
 Giesbrecht, W. R., 319 Scotia St., Winnipeg, Man.
 Glover, G. N., 1015 W. Mountain Ave., Fort Collins, Colo.
 Gomez, Ralph G., 1102 E. Rio Grande, Victoria, Texas.

- Grace, Oliver D., Otis, Colo.
 Graham, R. E., 1405 Morton, Pullman, Wash.
 Green, Frederick, 4706 E. Genesee St., DeWitt, N. Y.
 Griswold, G. H., Winterset, Iowa.
 Grohe, Frederick W., 36-49 211th St., Bayside, N. Y.
 Hardenbrook, Harry, Cope, Colo.
 Harmon, Glenn D., 35 Albion Ave., Albany, N. Y.
 Hawes, Richard L., Box 76-A, Route 2, Capitol Hill Station, Denver, Colo.
 Hawk, Ralph C., R.R.No. 2, Marion, Iowa.
 Hayes, Arthur F., R Bar Ranch, Birney, Mont.
 Head, Leland E., 1529 N. Nevada Ave., Colorado Springs, Colo.
 Heffin, Allen A., Gower, Mo.
 Hember, Ivan C., 616 13th St., Ames, Iowa.
 Hendershot, John M., 1504 Maple St., Pullman, Wash.
 Hodges, Thomas F., 243 W. Market St., Johnson City, Tenn.
 Hoerlein, Alvin B., 318 S. Grant Ave., Fort Collins, Colo.
 Hofstad, Melvin S., Stange Memorial Clinic, Ames, Iowa.
 Holtzman, Jacob, 1900 Arapahoe St., Denver, Colo.
 Hostrawser, Bruce, Malton, Ont.
 Howie, V. R., Fonda, Iowa.
 Huffman, R. P., P.O. Box 733, Wilmington, N. Car.
 Jasmin, Arthur M., 3 N. Rodney St., Helena, Mont.
 Johnson, Alva A., 5229 Guilford Ave., Indianapolis, Ind.
 Johnson, Leon Duncan, Alpha Psi House, Auburn, Ala.
 Johnson, Walford J., 506 3rd Ave., N.W., Jamestown, N. Dak.
 Kasel, Edward W., 8704 Santa Monica Blvd., Hollywood, Calif.
 Kay, Sidney R., 249 Hooper St., Brooklyn, N. Y.
 Kealey, V. C., 17 McDougall Ave., Ottawa, Ont.
 Kemper, J. H., Jefferson, Texas.
 Ketcham, John Edward, 714 Remington St., Fort Collins, Colo.
 Klein, James E., Box 194, College Station, Texas.
 Kothmann, Victor Lagle, 1125 W. Hubbard St., Mineral Wells, Texas.
 Kronfeld, C. L., Herndon, Texas.
 Lamberson, A. J., Whitehall, Wis.
 Levy, Abe, 5423 Broadway, Galveston, Texas.
 LiRocchi, V. W., Jr., 2820 S. Claiborne Ave., New Orleans, La.
 Livingston, W. Steele, 1004 Shaw St., Pullman, Wash.
 Logan, W. E., 1035 N. 29th St., Billings, Mont.
 Long, George, 232 W. Magnolia, Auburn, Ala.
 McCarthy, John Francis, 34 Railway Ave., Cortland, N. Y.
 McDonell, Leo E., Detroit Lakes, Minn.
 McEwan, Harry L., Elburn, Ill.
 McGee, Wm. R., 171 N. Second St., Hamilton, Mont.
 McMonagle, William D., 1605 F St., Pullman, Wash.
 Mackey, G. L., Depot St., Bedford, Va.
 Mank, George C., Route No. 5, Spokane, Wash.
 Manning, M. M., Yale, Iowa.
 Mason, C. T., 100 Barrows St., Jamestown, N. Y.
 Meskimen, Donovan O., 801 Remington, Fort Collins, Colo.
 Metzger, Lawrence R., 510 E. Mulberry St., Fort Collins, Colo.
 Meyer, Leo J., Washougal, Wash.
 Meyers, Luther D., 820 Burney St., Modesto, Calif.
 Miller, George G., Jr., 1321 S. Broadway, Denver, Colo.
 Miller, W. Wayne, 303 N. Swarts St., Abingdon, Ill.
 Minor, Raymond A., Waukon, Iowa.
 Minsky, Sol, Box 67, College Station, Texas.
 Mitchell, Howard H., 239 Grand Ave., Fort Lupton, Colo.
 Morgan, William D., South Coos River, Marshfield, Ore.
 Morris, Elbert Howard, Milroy, Ind.
 Mueller, William K., 690 W. LaFayette Road, Medina, Ohio.
 Mulqueeney, Michael O., 524 S. Livermore Ave., Livermore, Calif.
 Murphy, Richard O., Coin, Iowa.
 Myrah, Obed E., Okmulgee, Okla.
 Nagel, John K., 855 Humboldt St., Denver, Colo.
 Nicholl, Nelson L., Box 2232, Amarillo, Texas.
 Noland, James C., West Liberty, Iowa.
 Nuckolls, Melvin N., Blanchard, Iowa.
 Olson, Philip C., 1936 W. 82d St., Los Angeles, Calif.
 O'Neil, Henry E., 2 East St., Hudson Falls, N. Y.
 Packer, R. Allen, Clemons, Iowa.
 Paige, Ross S., Box 934, Baton Rouge, La.
 Palmer, H., 177 Glasgow St., Guelph, Ont.
 Partridge, C. F., P. O. Box 523, Roanoke, Ala.
 Pfarr, Phil J., Riverside, Wash.
 Phelps, G. J., 108 N. Laurence St., Montgomery, Ala.
 Pittman, D. W., Whiteville, N. Car.
 Poff, Roy J., 1306 Melrose Ave., N.W., Roanoke, Va.
 Presler, Donald J., Main St., Cambridge, N. Y.
 Preston, K. S., 311 W. Second St., Wayne, Neb.
 Puterbaugh, Rex, Lanark, Ill.
 Raps, Greg, 207 S. Hyland, Ames, Iowa.
 Rehkemper, W. L., 4128 Stanhope Ave., Dallas, Texas.

- Ricks, T. B., Box 583, Scotia, Calif.
Riley, Garrett W., Dawson Road, Route 3, Albany, Ga.
Riley, William F., Dept. of Surgery and Medicine, Michigan State College, East Lansing, Mich.
Robinson, Charles E., 768 Colorado Blvd., Denver, Colo.
Rodgers, Robert J., P. O. Box 61, Center, Texas.
Roth, Sidney A., Box 44, College Station, Texas.
Rowe, Kenneth B., 401 Edinborough Road, S., Guelph, Ont.
Ruebel, Lawrence V., 275 S. Third Ave., Brighton, Colo.
Rustad, Alvin, 215 W. Alcott Ave., Fergus Falls, Minn.
Salt, H. A., P. O. Box 165, New Philadelphia, Ohio.
Schalk, Karl W., Iowa Falls, Iowa.
Schroer, Jack W., 424 Plum St., Fort Collins, Colo.
Scully, John R., 131 N. Orange Ave., Sarasota, Fla.
Sears, Richard M., Nelson Road, Cazenovia, N. Y.
Seay, Lewis E., Mount Vernon, Texas.
Shaffer, X. B., 702 S. Richardson Ave., Vicksburg, Mich.
Shannon, James W., 53 High St., Florence, Mass.
Shay, H. Robert, 405 Remington St., Fort Collins, Colo.
Sherwin, Wilfred W., Orono, Ont.
Sheumaker, Robert G., Tingley, Iowa.
Shirley, Barbara G., 6769 Shoup Ave., Star Route, Canoga Park, Calif.
Shivers, Charles C., Room 230, State Capitol, Atlanta, Ga.
Silva, Paul, 144 12th Ave., San Mateo, Calif.
Sink, Edgar L., Shady Brook Ranch, Douglas County, Deckers, Colo.
Sjarring, Shirley, 2801 Turk St., San Francisco, Calif.
Skinner, W. L., Hdqrs., Dist. "D" CCC, Fort McClellan, Ala.
Smedley, W. L., Herman, Minn.
Smith, Lawrence G., Box 2225, College Station, Texas.
Smith, O. A., 721 S. Second St., Mankato, Minn.
Smith, Philip T., Malcolm, Neb.
Smith, Sydney M., 4040 El Camino Real, Palo Alto, Calif.
Sparks, Q. Wendell, Sully, Iowa.
Spencer, Carl G., 1955 "B" Ave., N.E., Cedar Rapids, Iowa.
Spennay, Willis A., Ellisville, Ill.
Sprouston, E. H., 3464 W. 36th St., Vancouver, B. C.
Stafford, Stuart B., Paxton, Neb.
Stafford, Wallace B., Jr., Summerfield, N. Car.
Stanford, J. E., P. O. Box 143, Stigler, Okla.
Stauch, Don M., Whiting, Iowa.
Steere, T. H., 712 W. Main, Ionia, Mich.
Steffen, Rudolph, R. 2, Horseheads, N. Y.
Storm, Robert E., Humeston, Iowa.
Stromlund, Ernest V., Jr., 2015 S. Royce, Sioux City, Iowa.
Sucher, Harry V., 607 California St., Pullman, Wash.
Suedhamp, G. R., Adrian, Mich.
Sullivan, William J., Funkstown, Md.
Sundberg, Carlton E., Newell, Iowa.
Sussman, Oscar, 85-55 115th St., Richmond Hill, Long Island, N. Y.
Swain, L. Clifton, Garden Grove, Iowa.
Tate, James K., 2132 Sunset Drive, Ames, Iowa.
Taylor, Edwin, 69 Tyson Ave., Roslyn, Pa.
Teeter, Wm. Robert, 135 S. Liberty St., Cumberland, Md.
Teetshorn, A. L., Whitewater, Wis.
Thaxton, Tom, Menard, Texas.
Thompson, R. A., Atwood, Ont.
Thorndike, Frank R., P. O. Box 778, Great Falls, Mont.
Toplitz, Theodore, 89 Hillside Ave., Winsted, Conn.
Torney, Ralph G., E. 214 Indiana Ave., Spokane, Wash.
Trull, E. R., Box 153, Bern, Kan.
Tweed, John R., 703 California St., Pullman, Wash.
Twiehaus, I. J., 7139 Sni-A-Bar Road, Kansas City, Mo.
Vance, Arthur A., 156 W. Third North St., Provo, Utah.
Varner, J. Gaylord, 830 Pine St., Trinidad, Colo.
Weaver, Glen J., 19 Hoag Ave., Akron, N. Y.
Webber, Le Roy, 130 Dartmouth St., Rochester, N. Y.
Webster, Carl D., Sheldon, Ill.
Werntz, Omar Gordon, 674 Locust St., Pasadena, Calif.
Werring, Daniel F., Springfield, Minn.
Wertman, Frederick D., Jr., Carlisle, Iowa.
Whatley, Urban, R. F. D. No. 2, Opelika, Ala.
Whitney, Leon F., Oakwood Road, Orange, Conn.
Wiggins, Harlan R., Gothenburg, Neb.
Wilder, Horace F., 243 S. Elmwood Ave., Buffalo, N. Y.
Wilbur, John Lee, Jr., 1226 "A" St., Hayward, Calif.
Wilkins, John E., 3504 S. Johnston St., Greenville, Texas.
Wood, Harold Wm., Box 2656, College Station, Texas.
Yingling, E. E., 220 Central Ave., Kearney, Neb.
Young, J. Richard, 1190 Centre St., Newton Centre, Mass.
Zancanella, August, 206 Seventh St., Glenwood Springs, Colo.
Zimdahl, Robert O., 1338 Lake Ave., Pueblo, Colo.

COMMENCEMENTS

Alabama Polytechnic Institute

At the 68th annual commencement exercises of Alabama Polytechnic Institute, held on May 27, the following candidates were presented for the degree of Doctor of Veterinary Medicine by Dean I. S. McAdory:

Iris M. Aultman	John M. McGlohon
John T. Billingsley	Bernard Marks
Cliston V. Bodine	John G. Martin
James A. Boehm, Jr.	Carl T. Mason
Peter F. Burnette	John T. Mitchell
Charles C. Burns	Charles F. Partridge
Carey C. Carlton, Jr.	Leonard N. Ritter
Timothy U. Cleary	Thurman C. Ross
Milton D. Coane	Edward C. Roukema
Clyde E. Deal	Willard O. Slappey
Lewis R. Diamond	William C. Smith
Hubert Q. Dorsett	Francis C. Sullivan, Jr.
Hubert F. Findley	B. C. Swindle
Abelardo G. Bird	Edward L. Trundy
Harold S. Gober	J. W. Vinson
William O. Greene	Hugo F. Vollberg
Thomas F. Hodges	George L. H. Weaver
Rafe A. Houston	Urban E. Whatley
Leonard D. Jacobs	Leon F. Whitney
Leon D. Johnson	Ralph L. Williams
Thomas W. Lennon, Jr.	Thomas M. Wise
Thomas W. Leonard	Joe M. Witten
Albert H. Locke	Arnold Wrabel
George Long	Tyler J. Young

Colorado State College

At the annual commencement exercises of Colorado State College, held on May 27, the following candidates, presented by Dean I. E. Newsom, received the degree of Doctor of Veterinary Medicine:

James L. Adams	Donald E. Barr
Owen E. Andrus	David E. Bartlett

Homer B. Brown	John E. Ketcham
Jack K. Bushnell	Donovan O. Meskimen
Maurice F. Calhoun	Lawrence Metzger
Ernest Cohan	George G. Miller
Merle E. Dawson	Howard H. Mitchell
Berton E. Elson	John K. Nagel
Harry E. Gaskill	Lawrence V. Ruebel
George N. Glover	Jack W. Schroer
Oliver D. Grace	H. Robert Shay
Harry Hardenbrook, Jr.	Edgar L. Sink
Richard Hawes	Stuart B. Stafford
Arthur F. Hayes	Jack G. Varner
Leland E. Head	Donald A. Wire
Alvin B. Hoerlein	August T. Zancanella
Jacob Holtzman	Robert Zimdahl

The commencement address was delivered by Charles A. Lory, who is retiring as president after 31 years of service in that position. August T. Zancanella and Alvin B. Hoerlein received the Phi Kappa Phi scholarship awards.

Cornell University

Dean W. A. Hagan of the New York State Veterinary College presented the following candidates for the degree of Doctor of Veterinary Medicine at the 72nd annual commencement exercises of Cornell University, June 17:

Milton S. Alberding	Ralph L. Gangarosa
George R. Alfson	Rebecca Gifford
Theodore Allen	Harold Grotenstein
Robert I. Ashman	Harlan S. Guile
James A. Baker	Clarence A. Jordan
John R. Bergerson	Paul Kahl
Helen M. Borchmann	Carleton R. Kelsey
James W. Boynton	Moe Kopp
Emily G. Chickering	Cyril J. Laughlin
Mrs. Clarence C. Combs	Edwin Leonard
Lynn B. Fake	Ferdinand A. Lombard
Anthony F. Favata	Ralph E. Loomis
	Garry V. McBride



New veterinary building at Colorado State College.

Frank E. McClelland, Jr.	Bernard W. Rosen
Karl Mayer	John E. Sawyer
Russell B. Oppenheimer	Herbert Shear
Vincent X. Paciello, Jr.	Norman E. Skinner
Jerome Patashnick	George J. Sullivan
Carleton W. Potter	Robert E. Thompsett
Adam G. Richtscheid	Abraham Vogel
Ralph E. Witter	Lee R. White
	Emery G. Wingerter
	Roscoe G. Wiswall

Adam G. Richtscheid died on June 18 from injuries suffered in an automobile accident on June 15.

Iowa State College

The annual commencement exercises of Iowa State College were held June 10. The degree of Doctor of Veterinary Medicine was conferred upon the following candidates, presented by Dean Charles Murray:

Malcolm Anderson	Harry O. Heddens
Aaron P. Antroinen	Ivan C. Hember
Donn E. Bacon	Melvin S. Hofstad
Abraham Barton	Vinton R. Howie
William G. Bauman	Dale H. Legenhausen
Elliott V. Beamer	Walter W. Miller
Russell J. Beamer	Eugene E. Moon
Max R. Benson	Richard O. Murphy
James W. Boller	James C. Noland
William R. Born	Melvin N. Nuckolls
Lloyd L. Boxwell	Raymond A. Packer
Gerold E. Brandt	Kenneth S. Preston
Elmer H. Braunworth	Allen R. Puterbaugh
Forrest E. Brutsman	Greg R. Raps
*M. Lois Calhoun	John G. Salsbury
Edmund J. Capesius	Robert G. Sheumaker
Evar Cedarleaf	Doyle W. Simonsen
Frank E. Connor	Earl D. Simonsen
Leon W. Cook	Carl G. Spencer
Ernest J. Dahlquist	Donald M. Stauch
William H. Dreher	Robert E. Storm
Ross J. Dundas	Ernest V. Stromlund
Ivan C. Elliott	George R. Suedkamp
Orin N. Emerson	Lee C. Swain
Elwood E. Everson	James K. Tate
Robert K. Fisher	Edwin P. Taylor
James O. Foss	Daniel F. Werring
Charles R. Forman	Frederick D. Wert-
Ralph C. Hawk	man, Jr.

Melvin S. Hofstad was the honor student in veterinary medicine, winning the George Judisch award. The winners of the G. G. Graham awards, which are based upon the records of the students' work in clinical practice, are Lloyd L. Boxwell, first prize, and Orin N. Emerson, second prize.

*Received degree at the close of the 1939 summer session.

Kansas State College

At the 77th annual commencement of Kansas State College on May 27, Dean R. R. Dykstra presented the following candidates for the degree of Doctor of Veterinary Medicine:

Carter H. Anthony	Perle E. Kimball
Neville L. Astle	Karl Knoche
Theodore M. Beard	Harold A. Krig
Victor B. Beat	Russell A. Leeper
James M. Brown	Paul T. Loyd
Frederick L. Buente	Robert MacDonald
Howard S. Cantwell	Walter F. Maninger
Bill M. Carnes	Gordon J. Marold
Glenn I. Case	Roy L. Mesenbrink
Richard A. Case	Albert P. Mitchell
Lloyd D. Cherry	Charles C. Moore
Stanley J. Dowds	Claude F. Murphy
†Orin Ellis	Paul R. Noller
Burt W. English	Paul E. Phillips
Carl F. Erickson	Buford D. Philpy
Truman B. Fleener	Nathan M. Rosenbaum
Frank G. Gillett	Stephen F. Rosner
Henry C. Graefe	William Rosner
Mark L. Greenberg	Leroy E. Schafer
Murray Greensaft	Francis N. Schlaegel
Frederic W. Hansen	Vincent J. Schweiger
Charles E. Hofmann	William E. Smith
James L. Hourrigan	Charles H. Snider
*Horton K. Howard	*Guy R. Spencer
Morgan K. Jarvis	Morgan W. Tempero
Ross L. Jewell	Glenn B. Van Ness
Kenneth L. Johnson	Charles K. Whitehair
Chester H. Kennedy	Leonard C. Witt
Francis M. Kennedy	*Dale J. Yokum

*With honors.

†With high honors.

Michigan State College

At the 82nd annual commencement of Michigan State College, the following students, presented by Dean Ward Giitner, received the degree of Doctor of Veterinary Medicine:

Paul Ambery	Howard S. Fike
Peter J. Babich	Isadore Harry Ganz
Edwin G. Balle	†Lester M. Greene
Frank H. Bartol	Gaylord R. Hartsough
Robert F. Bayard	Hylon J. Heaton
Bernard J. Berliner	Morris M. Himmelstein
Benjamin Bisgeler	Milton Horowitz
Herschall M. Bratt	Herbert R. Houghton
Emmett E. Brittin	*Leslie M. Hutchings
Henry C. Burns	Ronald F. Jackson
Antoon Busser	†Harry P. Johnson
Harry L. Butler	Robert S. Johnson
David S. Clark	Leon V. Jones
*Egbert S. Conklin	Walter J. Jones
Joseph M. Donaldson	Seymour L. Kalison
John A. Farnham	Robert F. Kieldsen
Willard R. Fetzer	Friend L. Kilburn

*With honors.

†Received degree at the close of the 1939 summer session.

Henry S. Kuzewski
 *Aubrey B. Larsen
 James D. Leary
 Joseph H. Lorber
 Wesley A. Mackenzie
 William G. Magrane
 Merle A. Mallo
 W. Wilson Matthews
 *Robert L. Mercer
 †Nathan Miner
 Robert Mitchell, Jr.
 Wilson B. Oler
 Rex M. Orr
 †Terry S. Ozler
 Elihu S. Padwee
 Burton K. Pearce
 Ellsworth N. Pearson
 Gerald C. Richardson
 Seymour R. Roberts
 Harold T. Rose
 Joseph S. Ruhe
 Lucian H. Scamman
 James F. Schieve
 Lyman A. Scribner
 Lawrence Segal
 Claud W. Sharps
 Oscar Sussman
 †Sherwood A. Wakeman
 Carl D. Webster

The senior prize offered by the Michigan State Veterinary Medical Association was awarded to Egbert S. Conklin, and the veterinary faculty prize, given annually to the outstanding second-year veterinary student, was awarded to Donald R. Morrill.

Université de Montréal

École de Médecine Vétérinaire de la Province de Québec, Université de Montréal, awarded the degree of Doctor of Veterinary Medicine to 13 candidates at the commencement exercises held on May 31, according to an announcement received from Father Yves.

Graduated with great honors were Telesphore Desrosiers, Henri-Paul Marcis and Jacques St-Georges, who received, respectively, the silver medal of the lieutenant-governor of the Province of Quebec, the Bonx medal and the prize of the Bank of Epargne.

Doctors graduated with honors were Joseph Nadeau, Donat Trudel, Martin Gauthier, Roger Perrier, Gaston Dufault, Pierre-Emile Mathieu, Robert Ferland and Roméo Raynond.

Jean Fleury and Grégoire Pagé also were awarded degrees.

The Ohio State University

The 63rd annual commencement exercises of The Ohio State University were held on June 12. O. V. Brumley, dean of The College of Veterinary Medicine, presented the following candidates for the degree of Doctor of Veterinary Medicine:

Max G. Badger	Francis D. Enzie
Albert J. Brandehoff	Edgar E. Evans
James R. Bridenstine,	Clinton H. Forthofer
Jr.	Murl A. Fox
Homer D. Carter	David A. Funderburg
Charles O. Cobb	Robert Getty, Jr.
Richard H. Cullop	Frank G. Hamilton
Donald E. DeTray	William F. Hartnell
James J. Dorman	Melvin J. Hatter
Duke H. Ducorsky	Charles W. Higley

*With honors.

†Received degree at the close of the 1939 summer session.

Robert J. Hocker	William C. Piper, Jr.
Donald W. Hott	Joseph E. Reid
Woodrow W. Jackson	Andrew J. Reiher
Robert D. Jones	Benjamin M. Schrank
Clinton A. Kackley	Francis M. Schwarm
Berlin W. Kagy	Hubert T. Shull
Abraham B. Kamine	Richard C. Smith
Floyd W. Koebel	Robert C. Smith
Gaylord C. Lewis	Vernon L. Tharp
William E. Martin, Jr.	Carl F. Vaupel
James A. McOwen	Edward G. Waite
Louis G. Northington	Edward J. Wilson
Loyd E. Oswalt	Richard M. Zirkle

Ontario Veterinary College

The following candidates received the degree of Bachelor of Veterinary Science at the convocation of the University of Toronto, May 10, according to an announcement received from C. D. McGilvray:

J. J. Andrich	W. D. Maher
G. L. Brown	D. C. Master
K. F. Burns	Forbes MacLeod
William Carroll	A. R. J. McGregor
L. I. Case	O. D. A. McQueen
F. L. Clark	W. R. Morgan
F. D. H. Clement	J. A. Murray
K. A. Cockburn	F. C. Nelson
A. F. Codlin	C. J. Padfield
R. J. Devereux	H. E. Palmer
D. R. Dockstader	W. D. Persson
Leslie Durant	C. E. Phillips
J. J. P. Fanning	R. C. S. Radmore
F. J. Gallivan	G. I. Roberts
David Garrick	K. B. Rowe
W. J. Gay	L. P. Rutherford
C. F. W. Gobert	G. A. Schiedel
G. R. Green	W. W. Sherwin
Richard Hellings	E. H. Sproston
J. E. Hendry	G. I. Steele
C. K. Hetherington	J. R. Steele
C. S. Hicks	W. J. Stinson
B. E. Hollister	V. G. Taylor
Bruce Hostrawser	W. A. Taylor
J. D. Huston	S. R. Thibaudeau
V. C. Kealey	R. A. Thompson
J. J. Keane	T. B. Toplitz
H. E. Knapp	J. E. Trimble
R. G. H. Livermore	J. R. Young

Prizes were awarded to members of the graduating class as follows:

Honor Standing

Gold medal for highest aggregate standing—O. D. A. McQueen of Stayner, Ont. Second and third prizes were awarded to J. J. P. Fanning of Beverly Farms, Mass., and D. Garrick of Toronto, Ont.

Andrew Smith Memorial Medal

G. I. Steele, Spencerville, Ont.

Helen Duncan McGilvray Prize

W. J. Gay, Foxboro, Ont.

Bacteriology

W. J. Stinson, Norwood, Ont.

Canadian Army Veterinary Corps Prize

F. C. Nelson, Smithville, Ont.

Milk Hygiene

C. E. Phillips, Edmonton, Alta.

University of Pennsylvania

At the 184th annual commencement of the University of Pennsylvania, held on June 12, George A. Dick, dean of the School of Veterinary Medicine, presented the following candidates for the degree of Doctor of Veterinary Medicine:

Morton Anmuth	Gilbert F. Hoppenstedt
Frank A. Ardito	*Walter A. Hughes
Gwendolyn G. Bodine	Herbert J. Jenne
William B. Boucher	Martin M. Kaplan
*Clyde I. Boyer, Jr.	Paul C. Kavanaugh
Roy L. Bridge	Raymond E. Kerlin, Jr.
Rex H. Brooks	John R. McCoy
*Raymond B. Church	Everett B. Miller
Donald B. Craig	Anthony A. Nitka
Samuel Edelstein	Luther L. Parker
Max Fields	Karl Persichetti
George J. Fleck	Gerald F. Priest
Robert G. Freil	*Joshua Rosen
M. R. Gardiner, Jr.	Harold E. Schaden
Robert C. Gaul	John H. Shellenberger
Ammon H. Gerberich	William L. Sippel
Chester A. Gleiser	Barney Spielholz
Roy S. Harry	Ben. L. Walbert, Jr.
G. L. Hartenstein, III	George E. Wortman

The J. B. Lippincott prize of \$100, for the highest general average in examinations during the four years, was awarded to Joshua Rosen.

The Jeannette Blair prize of \$50, for the best work done in the small animal clinic, was won by Clyde I. Boyer, Jr.

The Leonard Pearson prize, for the senior who, in the opinion of the faculty of the School of Veterinary Medicine, is best qualified, was awarded to Raymond B. Church.

The 1930 Class prize, a book, is awarded to the senior obtaining the highest average in the courses in surgery. Walter A. Hughes is the winner this year.

The Suburban Cattle Breeders' Association prize of \$25, offered to the sophomore who at-

tains the highest average in the course in physiology, was won by Charles W. Raker.

The anatomy prize of the Class of 1926, for the sophomore who does the best work in the courses in anatomy, was awarded to William E. Rothe.

Agricultural and Mechanical College of Texas

The 64th annual commencement exercises of the Agricultural and Mechanical College of Texas were held on May 31, 1940. R. P. Marsteller, dean of the School of Veterinary Medicine, presented the following candidates for the degree of Doctor of Veterinary Medicine:

J. L. Adrian, Jr.	Sidney R. Kay
Joseph Belinsky	J. E. Klein
Edward R. Betlach	Victor L. Kothmann
Jacob C. Blumenthal	Daniel H. LeGear
Edward M. H. Bobbitt	Sol Minsky
George H. Brumble, Jr.	Siegfried T. Neubert
Cecil E. Byrd	N. L. Nicholl
Henry D. Carpenter	Wilbur L. Rehkemper
Louis D. Chedester	Robert J. Rodgers
E. M. Christopherson	Sidney A. Roth
J. Porter Coble	Morton L. Sall
Stanley E. Cohen	Lewis E. Seay
Valton V. Cox	Lawrence G. Smith
Tyrus V. Dahl	Tom Thaxton
Fred. W. Grohe, Jr.	Omar G. Wernitz
Kalman R. Hamorszky	Byron M. White
Allen A. Heflin	Harlan R. Wiggins
	Harold Wm. Wood

State College of Washington

The 44th annual commencement exercises of the State College of Washington were held June 3. E. E. Wegner, dean of the College of Veterinary Medicine, presented the following candidates for the degree of Doctor of Veterinary Medicine:

Merle E. Christensen	George C. Mank
Franklin F. Cline	Leo J. Meyer
Edward L. Courtright	William D. Morgan
*George L. Dayman	Michael O. Mulqueeney
Floyd K. Dixon	Phillip C. Olson
Maurice H. Dubin	Phillip J. Pfarr
Stewart A. Fuller	Barbara G. Shirley
Joseph L. Gidley	Paul S. Silva
Robert E. Graham	Shirley M. Sjarring
John M. Hendershot	Harry V. Sucher
Arthur M. Jasmin	Frank R. Thorndike
W. Steele Livingston	Ralph G. Torney
William R. McGee	John R. Tweed
William D. McMonagle	John L. Wilbur, Jr.

*Completed work for degree during the summer of 1939.

*With distinction.

STUDENT CHAPTER ACTIVITIES

Iowa State College

The May 21, 1940, meeting of the Iowa chapter was called to order by President Emerson.

George R. Fowler, honorary president, gave a short address and then presented the chapter diplomas to the members of the senior class. He also presented the two presidents who served the chapter during the school year with gold gavels from the organization.

Melvin S. Hofstad, senior veterinary student, was the recipient of the George Judisch scholarship prize of \$25.00, given to the senior student with the highest average scholarship in the veterinary division. This scholarship is to pay dues in advance for membership and fees in the AVMA.

An election of officers was held and the following were chosen: president-elect, Al Tietze; vice-president, Walter Timms; secretary, Boyd Sawyer; treasurer, Joe Loucks; critic, George Lightcap; and sergeant-at-arms, J. W. Deaver.

WALTER TIMMS, *Secretary*.

Kansas State College

The Kansas State chapter held its annual dinner dance on May 4, 1940. Prizes and awards were given to the outstanding students in each class.

On May 14, 1940, G. L. Dunlap of Ashe Lockhart, Inc., presented a lecture on "Pathology of *Salmonella suipestifer* Infections of Swine." Dr. Dunlap employed lantern slides to illustrate his talk. After the literary portion of the program an election of officers was held and the following were elected and installed in office: president, Robert D. Immenschuh; vice-president, Hal Eyestone; secretary, Warren J. Dedrick; treasurer, William D. Bowerman; marshal, Marvin Stitt; and critic, Albert Coates.

WARREN J. DEDRICK, *Secretary*.

Michigan State College

The spring quarter activities of the Michigan chapter included three talks by prominent members of the profession. H. L. Cole of Saginaw, Mich., addressed the chapter on "Problems of Large Animal Practice," Cliff Carpenter of Fort Wayne, Ind., on "Vitamin Deficiencies in Chickens" and H. Dykema of Muskegon, Mich., vice-president of the Michigan State Veterinary Medical Association, on "Veterinary Ethics." The chapter held a successful picnic at Lake Lansing just before the close of the school year. Officers elected for next year are as follows: president, James Steele; vice-

president, Willard Lee; treasurer, Steve Kelly; and secretary, Paul Wagaman.

JAMES H. STEELE, *President*.

University of Pennsylvania

Miss Elizabeth J. Collins, recording secretary of the Pennsylvania chapter, had the misfortune to lose her keys recently. The AVMA identification disk caused the keys to be forwarded to the executive office, from where they were promptly mailed to Miss Collins.

Texas A & M College

The Texas chapter brought to a close the most successful year in its history with an election of officers for the 1940-41 collegiate year. The newly elected officers are: president, Ole Stalheim; president-elect, W. C. Banks; vice-president, A. Appleby; secretary-treasurer, V. C. Isaac; senior executive board representative, G. D. Stallworth; junior executive board representative and sophomore executive board representative, W. D. Ommert.

VERNON ISAAC, *Secretary-Treasurer*.

State College of Washington

A joint meeting of the Inland Empire Veterinary Medical Association and the Washington student chapter on May 4, 1940, climaxed a year of activity for the chapter. Over 300 members and guests attended the banquet and dance. Weden Humphrey, president of the chapter, acted as toastmaster. Speakers at the banquet were Dean E. E. Wegner, Otis C. McCreery, dean of men, and E. O. Holland, president of the State College of Washington. Dean Wegner introduced the members of the AVMA present and also spoke briefly to the graduating seniors, all of whom have applied for membership in the national organization. President Holland stated that the next building program to be inaugurated on the campus would include much-needed buildings for the veterinary division. The graduating seniors were presented with AVMA student keys during the banquet. Dean McCreery, a former All-American football player, was the principal speaker and was enthusiastically received. After the banquet a dance was held with music by Glenn Hopkins' orchestra. Mr. Hopkins is a member of the student chapter.

Other activities of the year include the regular biweekly meetings in which speakers from various departments on the campus and leading veterinarians from neighboring towns have participated. Two social meetings were held and two dances; the fall "Hobo Dance" and the spring banquet and dance in conjunc-

tion with the Inland Empire meeting. Inter-departmental athletic contests have been held between the veterinary and other leading departments of the school. In all but baseball the veterinarians have been victorious.

Officers of the student chapter for the present semester are: Weden Humphrey, president; Smith Willis, vice-president; James O'Connell, treasurer; Ernest Stone, secretary; and Cliff Bjork, publicity.

Robert Walker was honored for having the highest sophomore grades for last year. Lavon Koger had the highest grade standing for the first semester of this term in a biological science.

In the past year both the president, Ken Devine, and the vice-president, Ivan Petersen, of the Associated Students of the State College of Washington were members of the College of Veterinary Medicine. In addition, several key positions in student management were held by veterinary students.

New pledges to Alpha Psi, tapped at the banquet May 4, are:

Michael Mulqueeney	Ernest Stone
Wm. Douglas Morgan	Francis Jones
John E. Lindenmayer	Walter Schuele
Robert Donnelly	Edwin Stahl
Fred Bowers	Lavon Koger
James O'Connell	Luther Christensen
Leslie White	Donald Moyer

CLIFFORD BJORK, Publicity.

U. S. GOVERNMENT

New Sanitary Codes of the Public Health Service

Veterinarians, especially those engaged in food hygiene and inspection work, will be interested in two additional ordinances and codes soon to be recommended by the U. S. Public Health Service. Several years ago the public health service promulgated its widely known milk ordinance and code which is "recommended for adoption by states and communities in order to encourage a greater uniformity of milk-control practice in the United States." A number of states, especially in the South and Southwest, as well as numerous communities and a few large cities, have adopted this code.

The two new ordinances and codes relate to frozen desserts and to eating and drinking establishments; both have been under consideration and preparation for the past three or four years and were recently subjected to review and modification by the public health service sanitation advisory board preliminary to final revision and printing.

The purpose of the frozen-desserts ordinance and code is to encourage a greater uniformity

and a higher level of excellence in the sanitary control of ice cream, ices and similar products. Because of the nature of frozen desserts, their production and control, the public health service has not deemed it wise to recommend grading of the product as provided in the milk ordinance; instead, the new code provides for the grading of, or minimum requirements for, depending upon which type of enforcement the local authorities choose to adopt, the plants in which frozen desserts are prepared.

The new ordinance and code to be recommended for the regulation of eating and drinking establishments embodies the latest information available on legislation relating to the public health supervision of restaurants, cafeterias, taverns, soda fountains and the like. It represents another step in the direction of extending the public health service's program of so-called "environmental sanitation." The ordinance provides two alternative methods of enforcement: the grading and degrading system (grade A, grade B and grade C restaurants) and the minimum requirements system for all eating and drinking establishments. In the case of the grading system, it is to be remembered that the rating is on a basis of sanitation and not of culinary excellence.

Regular Army

Lt. Colonel Oness H. Dixon is relieved from duty at Fort Benning, Ga., effective on or about July 5, 1940, and assigned to duty at Fort Monroe, Va., and to additional duty as attending veterinarian, Nantsemond Ordnance Depot.

Announcement is made of the appointment of 1st Lt. David Samuel Hasson, Veterinary Corps Reserve, as first lieutenant in the Veterinary Corps, Regular Army, with rank from May 1, 1940. Lt. Hasson is assigned to duty at Fort Ringgold, Texas.

Major Ernest E. Hodgson is relieved from assignment and duty at Fort Ringgold, Texas, effective on or about June 20, 1940, and assigned to duty at Fort Logan, Colo., and to additional duty as attending veterinarian at Fitzsimons General Hospital. Major Hodgson is also assigned to additional duty as assistant to the officer in charge, Southwestern Remount Area, Colorado Springs, Colo., in connection with inspection and purchase of animals and operation of the Army-horse-breeding plan.

Captain John K. Allen is relieved from duty at Fort Bragg, N. Car., effective June 15, 1940, and assigned to station at the Army Medical Center, Washington, D. C., and will proceed to Washington and report to the commanding general for duty as a student at the Army Veterinary School.

The promotion of Major Frank M. Lee to the grade of lieutenant colonel with rank from May 16, 1940, is announced.

1st Lt. Robert H. Yager is relieved from

assignment and duty at Mitchel Field, N. Y., effective June 7, 1940, assigned to station at the Army Medical Center, Washington, D. C., and will proceed to that station and report to the commanding general, Army Medical Center, for duty as a student at the Army Veterinary School. Lt. Yager is assigned to temporary duty at Plattsburg Barracks, N. Y., for approximately three months, in connection with summer training and in connection with the First Army maneuvers.

The following-named officers of the Veterinary Corps, having been found by an Army retiring board incapacitated for active service on account of disability incident thereto, and such findings having been approved by the President, their retirement from active service on May 31, 1940, under the provisions of section 1251, Revised Statutes, and the act of Congress approved April 23, 1930, is announced:

Lt. Colonel Sawyer A. Grover, Fort Sheridan, Ill.

Lt. Colonel Peter T. Carpenter, Fort Logan, Colo.

Veterinary Corps Reserve

Under the provisions of Public, No. 18, 76th Congress, the following veterinary reserve officers have been ordered to active duty and assigned to stations opposite their names, for duty.

1st Lt. Edwin Morris Crawford, Scott Field, Belleville, Ill.

1st Lt. Harry John Robertson, Mitchel Field, L. I., N. Y.

NEW ACCEPTANCES—FIRST LIEUTENANTS

DeMilly, John Wailes, Jr., 511 New Federal Bldg., Atlanta, Ga.

Ozier, Terry Sam, Box 2006, College Station, Texas.

Rawls, Benj. Haskel, 841 Volusia Ave., Daytona Beach, Fla.

Scruggs, John Haskel, 700 S. Crockett St., Sherman, Texas.

PROMOTIONS—TO CAPTAIN

Chastain, Frank Lloyd, Colbert, Ga.

Fisherman, Henry, 503 U. S. Court House, Fort Worth, Texas.

Jerstad, Arthur Clifford, 335 Montgomery Ave., Laurel, Md.

Kuhn, George Anson, 2911 S. W. 9th St., Des Moines, Iowa.

Veterinary Corps Being Enlarged

The Veterinary Corps of the Army is being enlarged concurrently with the expansion of the military service. Although no provisions have yet been made to increase the commissioned personnel of the Regular Army, 30 reserve officers have been placed on extended active duty and the addition of 46 more

has been authorized. Moreover, the number of enlisted men has been increased to 639 and authorization to add another quota of 340 men has been obtained. The rumor that the Veterinary Corps is to be curtailed and probably placed under the direction of the Sanitary Corps is without foundation, according to authentic information received.

[That veterinarians in civil life stand ready to aid in the enactment of any legislation that may be required to maintain an adequate veterinary service in the coming expansion of the national defense is welcome information for the Association's executive office.]

The Farm Income

Though the figures for the different branches of farming are not yet available, the secretary of agriculture releases the following summary of the cash received by farmers during 1938 and 1939:

	1938 in millions	1939 in millions
Cash from products sold....	\$7,627	\$7,625
Cash from the government..	482	675
Totals	8,109	8,300

Whereas the income from marketed products dropped but \$2,000,000, the government payments increased by \$193,000,000 and thus provided the farmers with an income of \$191,000,000 more for 1939 than for 1938.

Poultry Inspection

In reorganizing the USDA in October 1938, there was created the agricultural marketing service. The report of this service for 1939 shows that 30,000,000 lb. of poultry were graded and a total of 48,000,000 lb. inspected as to wholesomeness. H.R. 7616, known as the Coffee Bill, now before Congress, is intended to centralize poultry economics by establishing a poultry division in the agricultural marketing service.

Founding of the BAI

The United States Department of Agriculture was created by an act of Congress in 1862. The law provided for the appointment of a commission of agriculture. Prior thereto, agricultural affairs were handled by the commission of patents, whose reports of the 1840's and 1850's mention the need of a veterinary service comparable with that in vogue in foreign countries. It was, however, not until the 1870's that veterinarians were actually employed to cope with the animal plagues causing losses among horses, sheep, cattle and swine amounting to \$100,000,000 annually according to the official report of 1875. The diseases causing so much havoc were admittedly confusing to the earnest but highly perturbed laymen in charge. It was

not until Detmers, founder of The College of Veterinary Medicine, The Ohio State University, Law of Cornell University, and his student Salmon came into the service that the chaos was ironed out and made the founding of a "veterinary bureau" inevitable. This was established, as most veterinarians now know, by an act of Congress passed in May 1884. Bureau of Animal Industry, U. S. Department of Agriculture was the name and D. E. Salmon, Cornell '78, was named as its chief. On page 1 is a brief on the rapidity with which the new bureau gave striking demonstrations of its worthiness.

Changes in Federal Bureaus

Effective July 1, the biochemic division of the U. S. bureau of animal industry was absorbed by the pathological and animal nutrition divisions. The pathological division is located in Washington and the animal nutrition division at the National Agricultural Research Center, Beltsville, Md.

At the suggestion of Secretary of the Interior Ickes, President Roosevelt has recommended the merger of the bureau of biological survey and the bureau of fisheries. The new agency will be known as the fish and wildlife service and will operate under a director who will be responsible to Secretary Ickes.

AMONG THE STATES

Colorado

R. M. Gow, livestock sanitary commissioner of Colorado, in conjunction with a committee appointed from the state veterinary association, has completed a survey of veterinary activities at sales rings. Using information obtained from this survey, Dr. Gow has rewritten the state law and has incorporated in the new document rules and regulations pertaining to the control of infectious diseases as influenced by these community sales.

Georgia

Efforts being made in the state for better coöperation of the county agents and veterinarians in disease control are evidenced by the following letter, which was sent to all county agents by W. S. Brown, director of the extension service of Georgia:

"From the reports coming in from different parts of the state it seems that there is a considerable amount of hog cholera, and especially does this seem to be true in southwest Georgia.

"It is also my impression that due to the present low price of hogs, the farmers are not doing the usual amount of vaccinating, which is probably the cause of the prevalence of hog cholera, as stated above.

"It is natural and customary for farmers to get somewhat discouraged and tend to lose interest in hogs during periods of low prices but we also know that as far back as we can secure records, hog prices have gone in cycles, and we have every reason to believe that better prices will again follow the present low levels.

"The trouble is that during the periods of low prices the farmers allow their supply of hogs to run down and their breeding stock to become so depleted that they lose much of the advantage of the succeeding better prices before they can rebuild their numbers sufficiently to cash in to any great extent. It seems to me that now is not only a good time to produce an adequate number of hogs for home supply and for the market, but also that it is a good time to get in some improved breeding stock at low prices where it is needed.

"I think that we should make every effort to bring this situation to the attention of farmers and urge them to guard against further losses by having their hogs treated against cholera. If the farmer does not have ready cash to pay for having his hogs treated, it seems to me that it would be good business to sell a sufficient number at the prevailing price to pay for having the remainder treated rather than lose all of them.

"You will recall that we have an agreement with the state veterinarian and the state veterinary association whereby the veterinarians will treat hogs for the cost of serum and virus plus 10 cents per head, where the county agent will assist in getting farmers lined up to have their hogs ready to treat on days agreed upon with the veterinarian serving the respective counties.

"I would urge, therefore, that we get behind this matter with the idea of stirring up renewed interest in protecting our swine industry and that we give particular attention to it in the sections of the state where severe outbreaks of cholera are occurring. I am sure you will find the veterinarians ready to coöperate with you and that you can promote the movement without having to give a great deal of personal attention to details."

Idaho

During the past year there has been a marked increase in the number of cases of hog cholera. This is due principally to the dissemination of the infection through sales rings. It is apparent that these sales are filling a real need of the livestock owner and are here to stay. Thus it is a matter of making adjustments to the changing conditions and placing ourselves in a position to properly regulate and supervise the sales rings when the livestock public is ready to support such action.

A. K. KUTTLER, Resident Sec'y.

Illinois

The summer clinic of the Mississippi Valley association, held at Abingdon, June 6, drew an attendance of 200 from five states. Demonstrations on horses, swine and poultry predominated. A fine day, a variety of operations and autopsies, skillful surgeons, excellent equipment for the handling of large animals, and a good luncheon given by the ladies of the Christian Church were features worthy of this annual event.

There were bovine, equine, swine, poultry, and sheep and goat divisions managed respectively by E. O. Smith, J. W. Lucas, E. T. Anderson, J. R. Christian, and R. R. Claybaugh. R. S. Warnock was in charge of restraint and L. N. Morin of anesthesia. Prominent among the surgeons were L. A. Gray, F. E. Brown, L. A. Dykstra, E. R. Kennedy, and F. C. Jones.

The officers of the association are A. R. Cowser, Farmington, president; C. M. Rodgers, Avon, vice president; and L. A. Gray, Bushnell, secretary-treasurer.

Iowa

The Southwestern Iowa Veterinarian, a four-page publication for distribution to the clients of the members of the Southwestern Iowa Veterinary Medical Association, made its debut in May. The editor is George A. Hawthorne of Clarinda. The purpose of the paper is to pro-



OFFICERS OF THE SOUTHWESTERN IOWA ASSOCIATION

Left to right: C. C. Steele, Treynor, vice-president; John Leuth, Council Bluffs, president; and Geo. B. Hawthorne, Clarinda, secretary-treasurer. The Association's executive board is composed of A. E. Nelson, Essex; George Wessels, Creston; and Geo. B. Senior, Creston.

vide the farmers with timely and authentic information on animal health. The first issue was circulated to approximately 1,000 farmers and the cost to each member veterinarian will be about 5 cents per copy. This will include the mailing of the magazine.

A. H. QUIN, *Resident Sec'y.*

The annual meeting of the Midwest Small Animal Association was held at Burlington,

March 7, 1940. Sixty veterinarians from Missouri, Illinois and Iowa were in attendance. Those participating in the program were Charles W. Bower, Topeka, Kan., who discussed "Digestive Disturbances of Pet Animals"; G. E. Burch of Iowa State College, Ames, Iowa, "Skin Diseases of Small Animals"; and L. H. LaFond, Detroit, Mich., "Canine Distemper, Complications, Prevention and Treatment." Dr. Bower also discussed the dog-food-testing program. The question box was handled by W. H. Riser, Des Moines, Iowa. Officers elected at the meeting were: president, C. L. McGinnis, Peoria, Ill.; vice-president, L. C. Brown, Decatur, Ill.; and secretary-treasurer, W. H. Riser, Des Moines, Iowa. C. E. Hunt, Mount Pleasant, Iowa, and F. E. Brown, Blandinsville, Ill., were elected to serve as members of the board of trustees.

Sensible animal disease control—in reverse—is exemplified by the formation of the Iowa State Serum Buying Agency, a subsidiary corporation of the Iowa State Farm Bureau Federation. This "new deal" offers 25,000 \$1.00 memberships to permit-holders. Stocks of anti-hog-cholera serum and other biological and sundry products will be placed in the headquarters of each county farm bureau. This arrangement is a glaring example of the triumph of purely mercenary interests over common sense in the control of animal plagues.

The Iowa farm bureau expects to sell 10 million cc. of serum, 125,000 cc. of virus and in addition approximately 45,000 doses of other biological products. The following excerpt from *The Grundy Register*, Grundy Center, Iowa, voices the sentiments of some Iowa business men in regard to this matter: "At the last meeting of the Wellsburg Commercial Club, the club went on record as being opposed to the farm bureau's doing a retail business in competition with local business and professional men, either directly or indirectly, as long as they are receiving support from the taxpayers of the state of Iowa. This motion was carried without a dissenting vote."

Thirty-six veterinarians attended the meeting of the Southeastern Veterinary Medical Association at Mount Pleasant on May 28, 1940. J. H. Kritchell, Keokuk, presented a case report on "Listerellosis of Sheep" and L. A. Dykstra, Galesburg, Ill., gave an illustrated lecture on the use of a new hog-cholera vaccine. Officers elected at the meeting are: president, G. A. White, Riverside; vice-president, C. M. Collins, Ottumwa; and secretary-treasurer, Thomas J. McCabe, Mount Pleasant. C. C. FRANKS.

Forty-seven members from 14 counties attended the March meeting of the East Central Veterinary Medical Society at Tipton. Food poisoning and its treatment was discussed by

J. W. Moranville and C. L. Lekwa. J. C. Carey, reporting for the Farm Bureau Relations Committee, indicated that taxpayers' money is being used to carry on a serum business in opposition to practitioners, which threatens to curtail the work of the established veterinary service. Dick N. Voetberg presented a plea in support of the farm bureau and advised members to join. C. E. Hunt led the discussion on this important departure.

The Bang's disease program was reviewed by J. A. Barger, federal inspector in charge of that work. George O. Shipley described a case of sweet clover poisoning. The executive board of the Eastern Iowa association discussed arrangements for the annual clinic at Waterloo.

GRANT MUNGER.

At the April 12 dinner meeting of the East Central Veterinary Medical Society, held at the Hotel Montrose in Cedar Rapids, 64 veterinarians from 25 counties were in attendance. The technical program was arranged by the Jones county members: W. W. Bronson of Wyoming, L. W. Kellogg of Anamosa, G. Alberty of Monticello, O. E. York of Monticello, and R. J. Kleinick of Onslow.

Dr. Bronson acted as quizmaster. His first subject was shipping fever in cattle. Frank M. Wilson of Mechanicsville, J. C. Glenn of Norway, L. W. Kellogg, R. B. Conaway of Melbourne, M. C. Larson of Keystone, F. R. Ahlers of Lamotte, W. A. Moeller of Waterloo, and L. A. Bowstead of DeWitt discussed the lesions, symptoms, etiology and treatment of the disease.

The next subject was contagious abortion in swine. S. G. Paul of Clarence, John B. Bryant of Mount Vernon, John Wineinger of Des Moines, J. S. Potter of Iowa City, L. Proctor of Hazleton, Jerry Wolfe of Grand Mound, and John W. Griffith of Cedar Rapids discussed prevention of the disease.

Control of abortion disease in cattle was discussed by N. A. Kippen of Independence, W. S. O'Brien of Ryan, R. E. Elson of Vinton, George M. Wormley of State Center, A. H. Quin of Des Moines, John Wineinger, James W. Pirie of Cedar Rapids, and President A. R. Stephenson of Bennett.

Prevention of the spread of scabies in live stock was discussed by C. H. Banks of Tipton, J. C. Glenn and S. G. Paul.

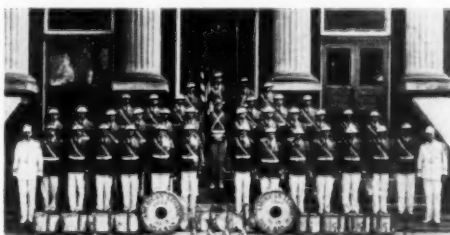
Deputy State Veterinarian W. C. Stewart of Maquoketa spoke on "County Testing for Bang's Disease in Cattle." A. H. Quin talked on "Farm Bureau Serum Sales." C. C. Franks of Grimes, secretary of the Iowa state association, spoke on the state organization's activities. John Wineinger told of the Bang's disease-testing accomplishments of the federal bureau of animal industry, and E. S. Dickey of Ottumwa spoke briefly on veterinary publicity.

Kansas

There is a growing trend among the practitioners of the state to sell veterinary supplies to their farm clients. This action, it is reported, has been taken in an effort to keep the veterinary products business in professional hands. The products which they sell are primarily serums, bacterins and poultry antiseptics. Although the profits derived are not great, some practitioners believe that the supplying of veterinary products is a business that rightfully belongs to them and, rather than to see the sales fall to drug stores, county agents and lay supply firms, are content with any profit that may be forthcoming.

Among members of the AVMA whose extra-professional activities have won civic recognition is Kent R. Dudley of Iola, Kan., drum major of the Iola American Legion drum and bugle corps.

In 1936, Dr. Dudley was awarded a life membership in the All American Drum Corps and



the All American Drum Majors Association. In 1939, he received the medal of award as champion drum major of Kansas in open competition.

The corps itself, shown in the photograph above, won the state championship in 1937 and 1939. It is supported financially by the Iola chamber of commerce and the City of Iola.

Twenty-three northeast Kansas veterinarians and their wives met at the Jayhawk hotel in Topeka on April 7, 1940. Following luncheon there was a discussion of calf scours and the encephalomyelitis-vaccination situation. Steps were taken to organize the group into a more permanent association. J. W. Lumb, Manhattan, was elected president and R. F. Coffey, Topeka, secretary-treasurer. It was decided that these two officers should arrange the programs. The Kansas State Veterinary Medical Association is attempting to organize all the veterinarians in the state in local groups.

R. F. COFFEY, Resident Sec'y.

Kentucky

A bill proposing to license all persons who had practiced veterinary medicine for a year or more prior to the passage of the act (intro-

duced February 21, 1940) was defeated in the house of the general assembly by a vote of 76 to 5. The bill, however, had been passed in the senate by a vote of 32 to 2. The activity of the veterinarians and friendly organizations such as the Horse and Mule Association of America defeated the measure.

Massachusetts

The Thirteenth Annual Conference of Laboratory Workers in Pullorum Disease Control was held at the Department of Veterinary Science, Massachusetts State College, Amherst, on May 22-24.

A total of 49 persons representing 14 states, the U. S. bureau of animal industry and Canada were in attendance.

Various aspects of pullorum disease eradication were discussed with special attention being given to *Salmonella pullorum* variation, pullorum disease and paratyphoid testing of turkeys, field technic and problems, doubtful reactors and the national plan of poultry improvement. Compiled testing results reveal marked progress in pullorum control and eradication. Other poultry diseases including fowl cholera, nutritional disturbances, duck diseases, neoplasms, coccidiosis, infectious bronchitis, infectious coryza, infectious laryngotracheitis, "unknown disease," staphylococcus infection, equine encephalomyelitis in birds and fowl paralysis were discussed.

The discussion of the various subjects brought out interesting observations which should be helpful in diagnostic, control and research work. The success of the meetings of the laboratory workers in the pullorum conference is attributed to the excellent *esprit de corps* in attempting to solve the problems of mutual interest.

William Hammond of the Harvard Medical School addressed the Massachusetts Veterinary Medical Association on February 28 at Boston. His subject was "Recent Studies on Virus Infections of Domestic Animals—Their Known or Possible Relation to Human Diseases." Many practical suggestions were given in the control of these diseases. Among important business matters discussed at the meeting was the idea of having a committee of the Association study the leptospirosis situation in the state.

At the March meeting of the Association, held in Boston on March 27, R. S. Youmans of Lawrence reported on "Mange and Other Skin Conditions in Cattle." L. A. Paquin of Webster presented several case reports on leptospirosis.

Michigan

The regular monthly meeting of the South-eastern Michigan Veterinary Medical Association was held on May 8, 1940. L. H. La Fond

spoke on "A Veterinarian's Experience at the Race Track" and later reported on the recent meeting of the American Animal Hospital Association in Hollywood, Calif. An U. S. Department of Agriculture film, entitled "Horses and Bots," was shown at the meeting.

E. E. Hamann of Michigan State College, secretary-treasurer of the Michigan State Veterinary Medical Association, was the principal speaker at the March meeting of the Association. He presented motion pictures of the European trip he took last summer. A government film, entitled "How to Handle Foxes," was also shown at the meeting.

Officers of the Association are: S. R. Elko, president, P. H. Kelly, vice-president, and F. D. Egan, secretary-treasurer.

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A report from Michigan dated in March announces that rabies is costing that state \$75,000 a year for rabies vaccine and professional service. The money spent for vaccinating dogs and other animals is not included in the figures. State Veterinarian C. H. Clark of the department of agriculture and Director A. W. Newitt of the department of health are charged with enforcing the control measures.

Minnesota

A meeting of the Lake Region Veterinary Medical Association was held on May 5, 1940, at Crookston. A. G. Karlson of the University of Minnesota was the guest speaker and his topic was "Bang's Disease." He also reported on research work being conducted on horses. Twenty-two members attended the meeting. Officers of the Association are: president, Louis Olson, McIntosh, and secretary, R. A. Hallquist, Brainerd.

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Veterinarians, physicians, dentists, lawyers and pharmacists of the six southwestern counties held an interprofessional meeting at Worthington on the evening of June 6, 1940, with approximately 165 in attendance. H. C. H. Kernkamp of the University of Minnesota represented the veterinary profession on the program.

Missouri

A feature of the large animal clinic to be held on July 2 at Excelsior Springs as a part of the summer meeting of the Missouri Veterinary Medical Association will be a median-line cesarean section on a registered Brown Swiss cow. The cow is owned by a client of Elmer Johnston of Excelsior Springs and was due to calve June 29, but because of a malformed pelvis the calf must be delivered surgically. This case is largely the reason for the date and place of this meeting, according to John Wells, secretary of the Association.

The Southeast Missouri Veterinary Medical Association held its spring meeting and clinic on May 23 at Cape Girardeau. J. P. Torrey, East St. Louis, Ill., S. W. Haigler, St. Louis, and John Nevitt, Cape Girardeau, president of the Association, addressed the morning session. In the afternoon, W. C. Dillard, Farmington, W. L. Stroup, Corinth, Miss., J. V. Moore, Hayti, S. L. Dorfman, Murray, Ky., D. E. Crites, Jackson, S. W. Haigler, C. F. Olds, Sikeston, and F. L. Cissell of Perryville took part in the demonstrations and the clinic. Officers elected at the business meeting following the program are: president, J. W. Trowbridge, Malden; vice-president, D. E. Crites, Jackson; and secretary-treasurer, W. C. Dillard, Farmington. The next meeting of the Association will be held on October 7 at Perryville.

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Roland M. Klemme, M.D., St. Louis University, St. Louis, addressed the St. Louis District Veterinary Medical Association on June 7. His subject was "The Surgical Treatment of Athetosis and Paralysis Agitans" and moving pictures were used to illustrate the presentation. By means of surgery Dr. Klemme has been able to correct this condition and restore a certain number of patients to a normal state of health. However, it is not known how long these persons will remain in normal condition. It is hoped that this line of treatment can be applied to dogs suffering with chorea.

J. P. TORREY.

Montana

State Veterinary Surgeon W. J. Butler of Helena is the new Montana delegate to the House of Representatives, having been elected to succeed H. F. Wilkins during the state association meeting at Bozeman, June 28-29.

Nebraska

Attempts to put city labor to work on farms caused the downfall of Latvia last month when Russia took possession. The object was to curtail unemployment and at the same time increase the food supply and improve standards of living.

The deposed president, Karl Ulmanis, who is known to American agriculture as a former University of Nebraska professor, was called the "father of his country" by the farmers and a "brain truster" by the town folks.

New Brunswick

The annual meeting of the New Brunswick Veterinary Medical Association was held on February 7, 1940.

Following are the officers elected for the ensuing year: president, T. Fred Johnston,

Saint John; vice-president, E. H. Cook, Saint Stephen; registrar and secretary, L. S. Doyle, Moncton; treasurer, L. A. Donovan, Saint John; members of the executive council, T. Fred Johnston, Saint John, J. T. Aikin, Fredericton, and J. A. Fowler, Upper Welsford.

New York

The regular monthly meeting of the Veterinary Medical Association of New York City was held in the Panel Room of the Hotel New Yorker on May 1, 1940.

The guest speaker was Raymond J. Garbutt, who presented an illustrated lecture on the "Fundamentals of Radiography." Two case reports were presented: "A Fatal Case of Cecitis in a Dog" by Ray W. Gannett and "A Strange Malady in an Eight-Month-Old Cat" by Henry Gordon.

J. J. MERENDA, *Secretary*.

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R. G. Green, M.D., professor of bacteriology, Medical School, University of Minnesota, known in veterinary medicine for his work on fox encephalitis and distemper for the Fromm Bros. fox and mink ranches, addressed the American Association of Clinical Pathologists in New York, June 7, on the nature of ultraviruses and virus diseases.

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A New York City correspondent writes that the various dairy companies will give up the use of horses for making their house to house deliveries. Motor-drawn vehicles are fast replacing horses in Manhattan. The same companies which have reduced their numbers of horse-drawn wagons for Manhattan are retaining them in the Bronx.

North Carolina

Work on Bang's disease control is progressing rapidly in ten counties. Recently, testing was begun in Edgecombe county.

J. H. BROWN, *Resident Sec'y*.

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An article in the *Raleigh News and Observer* by Charlotte Milton Green, popular writer on the marvels of plants and animals, is a clear story of the part the horse has played in the development of this civilization and especially the Americas, which rode to power and wealth on horseback. The article repeats what all students of the world's fauna should know, namely, the fact that horses were here in America millions of years ago, wandered to Asia, helped to build up the great nations of ancient times and then "came home" when the seafaring Spaniards hit this continent by accident in the 15th century of our era. Strangely, there are still wild (feral) horses in North Carolina. We

are indebted to Resident Secretary Brown for the fascinating article.

Ohio

Investigations carried out by a committee of the city council of Cleveland showed that diseased poultry in large quantities are being dumped into the markets of that city from large centers where inspection is maintained. It was found that from 10 to 15 per cent of the poultry received was not fit for human use. Arguing for an ordinance to control the sale of diseased poultry, Chief Buchanan of the city's food and drugs administration stated that of 43,000,000 lb. inspected by the federal government 17 per cent was condemned.

Pennsylvania

A symposium on skin diseases in animals was conducted by the Philadelphia Dermatological Society, March 15, 1940, in the veterinary building, University of Pennsylvania. This symposium was arranged through the efforts of J. V. Klauder, M.D., and with the cooperation of William J. Lentz, Mack A. Emmerson and Harry M. Martin of the veterinary faculty. Dr. Klauder, a prominent dermatologist of Philadelphia, has from time to time published articles on studies of skin diseases of animals in which he has frequently been associated with Dr. Lentz and others of the staff of the veterinary hospital. In his opening remarks at the meeting, Klauder emphasized the mutual need for a closer relationship between veterinary and medical schools in the study of skin diseases, pointing out the profitable results from comparative studies of this nature in the past. He mentioned the fact that this was the first symposium of its kind ever held in this country, although similar meetings have been popular in Europe.

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The meeting of the Conestoga Veterinary Club on April 10, 1940, was held in cooperation with the Pennsylvania bureau of animal industry, which was represented by C. P. Bishop, the director, and P. H. Seitz of the bureau laboratory. Both of these men spoke on various phases of the bureau's work on poultry-disease control. Dr. Seitz exhibited specimens of pullorum disease and bicarbonate of sodium poisoning. E. L. Stubbs of the veterinary faculty, University of Pennsylvania, addressed the meeting on poultry diseases. Officers of the club are: president, P. V. Clarkson, and secretary, N. C. Craig. Both Clarkson and Craig reside in Lancaster and are employed by the city in public health work.

A. H. CRAIGE, JR., *Resident Sec'y.*

Saskatchewan

Steps will be taken at a meeting of the provincial association at Saskatoon on August 3, 1940, to select a delegate and alternate to the House of Representatives, according to a letter received from Secretary Norman Wright. Papers on deficiency diseases of cattle by J. L. Miller, poultry diseases by D. W. McDonald and an unnamed one by A. Chambers are announced.

Texas

Three series of lectures by prominent veterinarians were presented at the School of Veterinary Medicine, Texas A & M College, during April and May. M. G. Fincher, professor of veterinary obstetrics, Cornell University, lectured April 20-22; Frank Breed, Norden Laboratories, Lincoln, Neb., April 22-May 3; and E. F. Schroeder, Boston, Mass., May 6-16. Dean Ross P. Marsteller invited every veterinarian in the state to attend these lectures.

Utah

The following resolution was passed by the Intermountain Livestock Sanitary Association, assembled at Salt Lake City, January 10, 1940:

WHEREAS, there is a heavy loss from disease among sheep, also from parasitic infestation, and whereas much of this loss is preventable through proper veterinary service.

And whereas this resolution, if put into effect, will give much added protection to this enormous investment in the foregoing territory (the number of sheep in the territory, according to the 1939 yearbook, is 21,325,000, with a cash value estimated at \$7.00 per head, or about \$150,000,000).

And whereas the officials of the forest service and grazing division of the Department of the Interior are investing large sums of money to develop the industry, it seems only reasonable that more adequate veterinary service should be provided by the U. S. bureau of animal industry.

Therefore, be it resolved that the Intermountain Livestock Sanitary Association here assembled requests the U. S. bureau of animal industry to create a district to include the intermountain states with a bureau veterinarian in charge—one who is well trained in the control of sheep diseases and parasitic infestation.

Virginia

A conference on Bang's disease was held at Bristol on June 10-12. Ten states, namely, Maryland, West Virginia, Kentucky, Tennessee, Florida, Georgia, Alabama, North Carolina, South Carolina and Virginia, participated in the meeting.

Washington

The state association publishes a quarterly bulletin edited by the officers, who are J. P. Johnson, Seattle, president; and H. W. Marsden, Seattle, vice-president. Besides the executive committee, the Washington component of the AVMA maintains committees on meat inspection, resolutions, membership, the practice act and poultry diseases.

Among the resolutions passed at the 1939 annual meeting was one complimenting the national association for the policy of cooperating with state associations in furthering the interests of the veterinary service. Another encouraged support of the regulatory forces in the campaign to control Bang's disease, a onetime hopeless problem now in the process of solution. . . The increase in local meat inspection made possible through the good offices of state and federal influence was commended. . . The Association expressed its appreciation to the state agricultural college and the BAI for sending delegates to the meeting. . . Efforts to improve the practice act were continued. . . Twenty-one were added to the membership.

West Virginia

Due to the prevalence of sheep scab in different parts of the state and also in sheep coming into the state, J. B. McLaughlin, commissioner of agriculture, has issued a regulation effective June 15, 1940, to the effect that all sheep or lambs entering any public market can not be returned to farms unless they have been dipped. This does not apply to animals shipped for immediate slaughter.

S. E. HERSHEY, *Resident Sec'y.*

Wisconsin

The May meeting of the Southeastern Veterinary Medical Association at Cedarville attracted an attendance of nearly 100. The program consisted of demonstrations on experimental fox encephalitis and Chastex paralysis at the Fromm Bros. laboratory at Grafton, a dinner, and after-dinner addresses. R. G. Green of the Medical School of the University of Minnesota delivered an address on the inclusion bodies of canine and fox distemper which he illustrated with lantern slides. D. M. Campbell, editor of *Veterinary Medicine*, spoke on the progress and importance of the veterinary service of a state, and L. A. Merillat, executive secretary of the AVMA, discussed organized efforts on the part of practitioners. A representative of Wisconsin fox breeders presented a moving picture portraying the magnitude and efficiency of fox farming in that state, an industry that can thrive only through scientific feeding and eternal vigilance in the control of sweeping infections and parasitisms.

In addition to being a pleasant social gath-

ering, the meeting left a deep impression on the importance of scientific research in animal production. Perhaps nothing more graphic was ever exhibited before a veterinary society than the 25 cases of experimental encephalitis produced by injections of the specific virus three days before the meeting. The animals (red foxes) showed the true clinical tableau of that fatal fox infection. The same number of cases of Chastex paralysis produced by feeding a ration depleted of vitamin B was likewise an amazing example of the fox breeders' resourceful methods.

Thirteenth International Veterinary Congress, Zürich-Interlaken, 1938.

Abstract of the account of the Congress

A) Revenues:

1) Donations from authorities, firms, veterinary societies and private persons	frs. 71'180.—
2) Subscriptions of members	" 56'960.90
Total	frs. 128'140.90

B) Expenses:

1) General secretary—office	frs. 32'694.94
2) Handbook, report of the Congress and printed matters	" 52'338.40
3) Expenses of the Congress Zürich and Interlaken incl. exhibition	" 33'132.56
4) Contribution to the permanent committee at La Haye	" 1'500.—
Surplus: transferred on the 8th of March 1940 to the Swiss Veterinary Society, Emmenbrücke.	frs. 119'665.90
Zürich, 13th of March 1940.	frs. 8'475.—

The financial committee:
Baer Heusser

The Swiss Veterinary Society has examined and accepted the above accounts at its general meeting of January 21, 1940.

News from Abroad—Scotland

In a letter received recently from Principal A. W. Whitehouse, Glasgow Veterinary College, it is reported that students of the 3rd, 4th and 5th years are to finish their course, will not be affected by the draft and will not be permitted to enlist. Students of the 1st and 2nd years must go into service when they are called upon as enlisted personnel of the Royal Army Veterinary Corps. It seems that in spite of having mechanized nearly all of the cavalry, there are to be a considerable number of pack and draft animals and that the R.A.V.C., may eventually almost attain the proportions of the last war.

Germany

"News Flashes from Germany," as of June 8, announce the celebration of the 150th anniversary of the Berlin Veterinary College, which was founded by Frederick the Great as a "school of animal medicine." From 1887 to 1933, this college was an independent institution. Since the latter date this college has been a faculty of the University of Berlin.

COMING MEETINGS

Missouri Veterinary Medical Association. Elms Hotel, Excelsior Springs, Mo. July 1-2, 1940. J. L. Wells, secretary, 1817 Holmes St., Kansas City, Mo.

Small Animal Hospital Association. Los Angeles, Calif. July 2, 1940. W. K. Riddell, secretary, 3233 W. Florence Ave., Los Angeles, Calif.

St. Louis District Veterinary Medical Association. 7800 Olive St. Rd., St. Louis, Mo. July 5, 1940. J. P. Torrey, secretary, 610 Veronica Ave., East St. Louis, Ill.

Oregon Veterinary Medical Association. Portland, Ore. July 8-10, 1940. (Reorganization meeting to be held in conjunction with the Pacific Northwest Veterinary Medical Association.) For detailed information regarding these meetings write to Dr. James B. Harrison, 2850 N. E. Union Ave., Portland, Ore.

Ontario Veterinary College Short Course for Veterinarians and Ontario Veterinary Association. Ontario Veterinary College, Guelph, Ont. July 9-11, 1940. W. J. Rumney, secretary, 612 King St., W., Hamilton, Ont.

Kentucky Veterinary Medical Association. Brown Hotel, Louisville, Ky. July 10-11, 1940. F. H. Riester, secretary, Buechel, Ky.

New Jersey, The Veterinary Medical Association of. Hotel Claridge, Atlantic City, N. J. July 11-12, 1940. J. G. Hardenbergh, secretary, c/o Walker-Gordon Laboratory Co., Plainsboro, N. J.

San Diego County Veterinary Medical Association. Zoological Research Bldg., Balboa Park, San Diego, Calif. July 15, 1940. Paul D. DeLay, secretary, State Poultry Pathological Laboratory, Balboa Park, San Diego, Calif.

Southern California Veterinary Medical Association. Chamber of Commerce Bldg., Los Angeles, Calif. July 17, 1940. Charles Eastman, secretary, 725 S. Vancouver Ave., Los Angeles, Calif.

Georgia State Veterinary Association. Moultrie, Ga. July 17-18, 1940. J. E. Severin,

secretary, 357 Edgewood Ave. S. E., Atlanta, Ga.

New York State Veterinary Medical Society. Hotel Seneca, Rochester, N. Y. July 18-20, 1940. F. F. Fehr, secretary, 243 S. Elmwood Ave., Buffalo, N. Y.

Collège des Médecins Vétérinaires de la Province de Québec (College of Veterinary Surgeons of the Province of Quebec), annual convention. Montreal, Que. July 19-20, 1940. G. T. Labelle, secretary, 5053, Christophe-Colomb, Montreal, Que.

Veterinary Association of Saskatchewan. University of Saskatchewan, Saskatoon, Saskatchewan. August 3, 1940. Norman Wright, secretary, Saskatoon, Saskatchewan.

Vermont Veterinary Medical Association. Waterbury, Vt. August 9-10, 1940. G. N. Welch, secretary, 43 Union St., Northfield, Vt.

American Veterinary Medical Association. Mayflower Hotel, Washington, D. C. August 26-30, 1940. L. A. Merillat, secretary, 221 N. La Salle St., Chicago, Ill.

State Board Examinations

Oklahoma Board of Veterinary Medical Examiners. State Capitol Bldg., Oklahoma City, Okla. July 1-2, 1940. Further information may be obtained from W. C. McConnell, secretary, Holdenville, Okla.

Connecticut Board of Veterinary Registration and Examination. State Office Bldg., Hartford, Conn. July 2, 1940. Further information may be obtained from Geo. E. Corwin, secretary, State Office Bldg., Hartford, Conn.

Maine State Board of Veterinary Examiners. July 8, 1940. Further information may be obtained from the secretary, S. W. Stiles, Falmouth Foreside, Me.

Indiana Veterinary Examining Board. Room 209 State House, Indianapolis, Ind. July 9, 1940. All applicants must be in the office of the state veterinarian by 8:00 a. m. of said day. Application blanks may be secured from J. L. Axby, secretary, Room 209 State House, Indianapolis, Ind.

Utah Veterinary Medical Examining Board. Room 302, State Capitol Bldg., Salt Lake City, Utah. July 15-16, 1940. Applications may be obtained from the secretary at the above address. Applications must be accompanied by \$15, to cover fee.

Illinois State Board of Veterinary Examiners. Chicago, Ill. July 29-30, 1940. Applicants will secure blanks and instruction as to fee, qualification, hours and address of examination room from the Superintendent of Registration, Department of Registration and Education, Springfield, Ill. The examining board consists of W. W. Warnock, Aledo; W. H. Shaw, Paw Paw; and L. A. Merillat, chairman, Chicago.

PERSONAL NOTES

Births

To Dr. (Iowa '34) and Mrs. Roger P. Link of Manhattan, Kan., a son, Donald Charles, February 27, 1940.

To Dr. (U. P. '37) and Mrs. James A. Frazee of Clinton, N. J., a daughter, Patricia Jean, May 7, 1940.

To Dr. (Iowa '25) and Mrs. Mack A. Emmer-son of Philadelphia, Pa., a daughter, Nancy Caroline, May 9, 1940.

To Dr. (Corn. '34) and Mrs. E. W. Holden of Norristown, Pa., a son, Oliver Wendell, May 29, 1940.

Marriages

Sidney S. Bjornson (Iowa '39) of Fargo, N. Dak., to Florence Dinwoodie of Fargo, N. Dak., daughter of J. T. Dinwoodie (U.P. '13), May 25, 1940.

Charles H. Cunningham (Iowa '38) of Centerville, Md., to Thelma Ulrich of Pella, Iowa, May 22, 1940.

Activities

H. J. Magrane (McK. '13) of Mishawaka, Ind., has formed a partnership with his son, William (Mich. '40).

Drue S. Ward (Texas '39) has purchased the practice and equipment of the late W. R. Sanderson, Brownwood, Texas.

Louise Sklar Rabstein (K. S. C. '34) has resigned from the laboratory staff of the Maryland livestock sanitary service.

W. L. Black (Colo. '24) of Portales, N. Mex., is in charge of the first artificial insemination association organized in his state.

E. W. Wupperman (Texas '35) of Austin, Texas, announces the completion of a new animal hospital at 5908 Georgetown Rd.

Among the new names appearing in *Who's Who* for the first time is that of Edward Records (U.P. '09), University of Nevada, Reno.

Sam W. Wiest (St.J. '19) after 24 years in the service of the U. S. bureau of animal industry has resigned to enter practice in Santa Fe, N. Mex.

J. J. Staab (McK. '41), federal inspector in charge, Montpelier, Vt., started with his family on an extended vacation tour of the West the early part of June.

Edward A. Tugaw (Wash. '38), formerly associated with the bureau of animal industry and the civilian conservation corps, has purchased the practice of the late J. P. Clark (K.C.V.C. '18) of Caldwell, Idaho.

Geo. C. Coburn (Texas '39), formerly of Min-

eral Wells, Texas, is now associated with C. W. Bower of Topeka, Kan., member-at-large of the Executive Board. Clarence Thompson (K.S.C. '41) is the junior assistant of the Bower hospital.

Otto Stader (U.P. '18), inventor of the Stader reduction splint, reports that Paramount Pictures, Inc., has made a picture illustrating the use of his splint. It will be issued as a "popular science" movie. The pictures were taken in color.

L. Van Es (Ont. '93) is senior author of a new bulletin (research bulletin No. 118, Neb. Agr. Exp. Sta., Lincoln) entitled, "An Inquiry into the Influence of Environment on the Incidence of Poultry Diseases." It consists of 57 pages and is profusely illustrated with charts and photographs.

W. C. Scofield (O. S. U. '36) of the department of veterinary science, Louisiana State University, is assisting with the work of the national poultry improvement program in Louisiana. He presented two papers before the Mississippi Poultry Improvement Association meeting held at Gulfport, May 30 and 31, 1940.

DEATHS

Max D. Henly, 46, prominent Indiana veterinarian, succumbed to pneumonia May 22, 1940. Born at Crowley, La., Dr. Henly was graduated from Terre Haute Veterinary College in 1916 and practiced at Wingate for 20 years. He was a member of the Masonic Lodge, Order of the Eastern Star and the American Legion post at Hillsboro. The widow and a sister survive. Dr. Henly joined the AVMA in 1926.

Samuel W. Schuppan of Brunswick, Ga., died suddenly after a long illness on February 22, 1940. Dr. Schuppan was a graduate of the American Veterinary College (1890) and was a former member of the national association.

James P. Clark of Caldwell, Idaho, was killed in an automobile accident on February 6, 1940. Dr. Clark was graduated from Kansas City Veterinary College in 1918 and practiced in Caldwell for five years prior to his death.

John Bell of Nashville, Tenn., passed away in December 1939. He was graduated from Kansas City Veterinary College in 1894.

Joseph Stafford of Boston, Mass., a graduate of Kansas City Veterinary College (1906), died on October 22, 1939.

F. E. Jones of Rochelle, Ill., well-known Illinois practitioner, passed away on April 10, 1940.

R. W. Biggs of Eatonton, Ga., died of a heart attack on April 7, 1940. He was a graduate of the University of Georgia (1922).

Robin Roy Morris of Nashville, Tenn., assistant state veterinarian, passed away in his office on April 19, 1940. He attended Terre Haute Veterinary College and received his degree in 1914. Dr. Morris was widely known throughout the state by the livestock people, whom he served for many years. Dr. Morris was a member of the Tennessee Veterinary Medical Association, and he joined the AVMA in 1939.

Lucien B. Ernest of Kensington, Md., died at his home after a long illness on March 15, 1940. Dr. Ernest was an employé of the federal bureau of animal industry for 30 years and was retired in 1929 on account of ill health. He was a member of the Masonic lodge and mayor of Kensington at the time of his death. Dr. Ernest was graduated from the United States College of Veterinary Surgeons in 1915.

J. W. May of Mobile, Ala., died after a brief illness on December 9, 1939. Dr. May, a graduate of Alabama Polytechnic Institute (1921), established a general practice in Mobile in 1921 and continued to practice in that city until his death.

E. B. Jones of Vernon, Texas, passed away March 24, 1940, at the veterans' hospital in Waco after an illness of three years. Dr. Jones was born at Walnut Grove, Miss., on October 26, 1890, and was graduated from the Southwestern Veterinary College in 1916. Dr. Jones joined the AVMA in 1929.

Warde F. Meyer of Pendleton, Ore., was killed in an automobile accident on March 27, 1940. Dr. Meyer, an employé of the federal bureau of animal industry, met instant death when his car collided with a lumber truck. Born on October 29, 1913, at Ortonville, Minn., Dr. Meyer was graduated from the State College of Washington in 1938. He married Glee Miller on August 23, 1938. Dr. Meyer joined the AVMA in 1939.

John W. Woods, 71, of Walla Walla, Wash., died on March 23, 1940, after an illness of three months. Dr. Woods was graduated from the State College of Washington in 1902. He was a former member of the AVMA.

James Fairley, 73, of Florence, N. J., died at his home May 12, 1940, after an illness of two weeks. Dr. Fairley, a graduate of the University of Pennsylvania, operated a hospital in Philadelphia for many years.

Charles R. Niday of Gallipolis, Ohio, died of a stroke on December 12, 1939. Dr. Niday graduated from the Cincinnati Veterinary College in 1913 and was a former member of the AVMA.

Maurice R. Shale of Chicago, Ill., died on April 17, 1940. Dr. Shale was born on April 17, 1915, in Paris, France, graduated from The Ohio

State University in 1939 and joined the AVMA in 1939.

Walter R. Carroll of Brookline, Mass., passed away on February 24, 1940. Dr. Carroll was born on September 20, 1872, at Brookline, Mass., graduated from the Chicago Veterinary College in 1915 and joined the AVMA in 1919.

Herman H. Wolf of Walnut Park, Calif., died on May 9, 1940. Dr. Wolf was graduated from Western Veterinary College in 1901 and joined the AVMA in 1933.

H. J. Clemens, 56, of Amery, Wis., died on April 11, 1940. Dr. Clemens was graduated from the Chicago Veterinary College in 1918 and established himself in practice in Amery the same year. He is survived by his wife and two daughters.

Thomas J. McCormick of San Francisco, Calif., died on March 2, 1940. Dr. McCormick was born on May 26, 1882, at Denver, Colo., was graduated from the Chicago Veterinary College in 1920, and joined the AVMA in 1929.

Earl E. Eiler of Duluth, Minn., passed away on March 3, 1940. Dr. Eiler was born on February 9, 1893, at Duluth, and graduated from McKillip Veterinary College in 1920.

Mrs. J. M. Sutton, wife of **J. M. Sutton** (K. S. C. '14), state veterinarian of Georgia, passed away May 9, 1940, at her home in Syl-vestor.

Mrs. Maude E. Smith, wife of **George O. Smith** (Ont. '00) of Ligonier, Ind., passed away May 22, 1940, as the result of injuries received in an automobile accident. Dr. Smith also was seriously injured in the accident but is expected to recover.

Prof. L. Panisset, lieutenant colonel of the French army and distinguished teacher, scientist and author of the Alfort school, passed away in the line of military duty at the cavalry school of Saumur in March. The deceased is recalled as a deep thinking, ultra-polite member of the Alfort staff who was profoundly devoted to his work and a fluent contributor to the literature. Greatly indebted to him, the veterinary profession of the world has sadly annunciated his untimely death and has extended its sympathies to the members of his family. Prof. M. Panisset of the veterinary school at Oka, Que., is his son.

Pierre Lubay, director and professor emeritus of the school of veterinary medicine at Cureghem (Belgium), died in April at the age of 72. Professor Lubay is remembered as the official delegate of his now ill-fated country at the Twelfth International Veterinary Congress in New York (1934), where his fine personality won him a host of American friends. The high scholastic standing of Belgian veterinarians and the excellence of the Belgian veterinary service are largely due to his resourceful and philosophic mind.

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BTV (*Tissue Origin*)

and

CRYSTAL VIOLET (*Blood Origin*)

Thousands of hogs have been successfully immunized with these vaccines. There have been no "vaccination breaks." Instead there has been a marked reduction in losses from secondary infections such as pneumonia and enteritis. It has been further noted that there is no "vaccination stunting." Pigs stay on feed and frequently reach the market well ahead of serum-virus treated animals. With BTV or Crystal Violet the need for virus in the field is eliminated.

The use of Crystal Violet or BTV will prove a boon or a boomerang to the hog raiser and the veterinarian in charge depending upon the care, or lack of it, of the veterinarian and the intelligent cooperation, or lack of it, of the client. To the careful worker who will use clothes and instruments not previously used in virus work—who will refrain from using either vaccine on hogs infected with or exposed to hog cholera—and whose clients will cooperate in keeping virus off the premises for the two weeks necessary to build immunity—these vaccines will prove a God-send. To the careless worker, or one with uncooperative clients, they will prove headaches for all concerned.

•
Sales restricted to graduate veterinarians



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AMPHYL is practically non-toxic, a very important feature in the treatment of dogs and cats, which are prone to lick their wound dressings.

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For the Disinfection of surgical instruments, rubber articles and other appliances.

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For Antiseptic Irrigation of Body Cavities—also for douches at delivery time (calving, lambing).

As a Shampoo—especially for small animals. As a deodorant dressing. For the operator's hands, as an antiseptic rinse.

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Animals That Make the News

Seals in Modern Commerce

THE USE of the skins of beasts, with the fur still on them, as clothing, is of ancient origin. The Chinese and Japanese used furs in this manner at least 2,500 years ago. The Romans also prized furs highly, and the Crusaders brought furs into general favor in Europe, where much extravagance was shown in using them.

It was to meet this demand that pioneer explorers penetrated the northern forests of America and established trading stations. Many flourishing American cities are the outgrowths of these stations.

Seekers for fur must now go beyond the extreme limits of civilization, especially in America, and the Arctic regions are hunted over to obtain valuable pelts. To meet the increased demand for furs, domestication and breeding were developed, and fur farming for many types of animals is now undertaken on a large scale.

Sealskin is one of the most handsome and desirable of furs. In ancient times all seal-skin was genuine, but through modern dressing and dyeing methods satisfactory substitutes in low-priced furs have been developed.

"Northern seal" is dyed coney, better known as rabbit. The old English name for the rabbit was "coney," which has led to the application of this term in common usage. Coney fur is used for the least expensive "seal" coats because of its abundance and its close resemblance to genuine seal when properly dyed. The very prolific rabbit may breed four to eight times a year. From three to eight are born at each time, and sexual maturity is reached in about six months.

There are ten well-established varieties of domestic rabbit, the original stocks of which were obtained from almost as many countries. The United States leads the

(Continued on page xx)

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The high, readily absorbed calcium content is a distinct advantage in effecting prompt recovery from milk fever where large doses of calcium are indicated. Relapses have not occurred where "CALCIUM BORO-HIBATE Lederle" was used in clinical trials.

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51 Years Making Quality Products.

Animals That Make the News

(Continued from page xvi)

world in the production of northern seal
coats.

"Hudson seal" is the term furriers apply
to dyed muskrat. The muskrat is an aqua-
tic, rat-like rodent, so called because of its
musky odor. Trapping for this animal is
done chiefly in winter, since at this season
the fur is thick and glossy. The color is
dark brown above and grayish below and
is left in the natural state for muskrat
coats. However, by far the greatest num-
ber of skins are dyed black to produce the
long-wearing, fashionable Hudson seal. In
spite of the number so used, the muskrat
seems to flourish, apparently because its
natural enemies which once infested the
country are almost extinct, thus enabling
trappers to supply the great demand.

"Alaskan seal," the genuine sealskin, is
confined to the north Pacific Ocean and the
Bering Sea.

Hair seals are an important group, the
commonest form of which is found in bays
and sheltered waters. The most numerous
of these is the harp or saddle-back seal.
Hair seals are less migratory than fur seals,
although many of the Arctic species pass to
the south with the ice in winter and return
to the north in the spring for the breeding
season.

The fur seals of the Otariidae, however,
have the greatest commercial importance.
They have a rich, silky undercoat of fur,
the true sealskin of commerce.

The typical male fur seal, or bull, attains
maturity at the age of 7 years, weighs 400
to 500 lb., and is about 6 ft. in length with
a girth of about 4.5 ft. He is blackish or
dark brown, with yellowish-white water
hairs especially long on the back of the neck,
forming the "wig" or mane.

The adult female, the cow, is smaller,
averaging only about 80 lb. in weight. Her
color is in varying shades of brown. She
bears her first young, called the "pup," at
the age of 3 years and has a breeding life
of about 10 years. At the end of the breed-
ing season, late in April, the animals are
taken while they are still on the ice caring

(Continued on page xxii)

77th Annual Meeting

American Veterinary Medical Association

I am planning to attend the 77th annual meeting of the AVMA in Washington, D. C., August 26-30, 1940.

Signed

City & State.....

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Animals That Make the News

(Continued from page xx)

for their young. The pups make up about four fifths of the catch.

Sealskins are cured in salt and then dressed and dyed. Dressing means removal of the coarse water hairs which grow out beyond the fur by shaving down the flesh side of the skin to cut off the roots of the hairs which grow deeper than the fur. The hairs are then pulled out and the fur, originally a rusty brown, is most frequently dyed black, requiring seven dippings.

The fur-seal industry is directly under the management of the government. The United States in 1911 secured the coöperation of other countries in a treaty suspending pelagic sealing for a period of 15 years. During that period the herds became fully restored and even increased so that at the present time the income to our country from the sealing industry exceeds \$5,000,000 annually.

Great Britain Bans Use of Milled Wheat Products for Dog Foods

Dogs of Great Britain will not get flour or any milled wheat product in their food under a new wartime-emergency ruling by the food ministry effective May 6. The order also affects livestock feeds.

The pulse rate of the squirrel is over 300 per minute. When the animal hibernates the rate drops to 17 per minute and the body temperature falls below that of the surroundings, but never below freezing.

From Georgia comes the yarn about a large rattlesnake lying on a highway that sank its fangs into the tires of an approaching automobile and crawled away leaving the driver to fix a flat tire.

Irish fishermen have a novel method of catching mice in their shacks. They use live oysters. These are scattered around and when a mouse sticks its nose or foot into the half-open shell, the oyster closes up on it.—Karl Kulberg in *This Week*.

In Controlled Experiments

COMPETENT, UNBIASED RESEARCH WORKERS HAVE FOUND THAT LOCKHART RABIES VACCINE CONFERS HIGH RESISTANCE TO INFECTION. THESE EXPERIMENTS WERE CONDUCTED ON DOGS, AND PROVE THE VALUE OF RABIES VACCINATION FROM THE RESEARCH POINT OF VIEW. CLINICIANS HAVE LONG SINCE RECOGNIZED RABIES VACCINE AS AN EFFICIENT AGENT.

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Mature sheep—2 ounces.
Swine (50-100 lbs.)—1 ounce.
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